

# COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper

Second-class postage paid at Boston, Mass., and additional mailing offices

ear

February 7, 1973

Vol. VII, No. 6



## Framingham Computer Budget Cut by 40%

FRAMINGHAM, Mass. — The proposed budget for the Regional Vocational Technical School (Voke) computer for training data processing students [CW, Jan. 17] has been cut by 40%, according to Voke Superintendent Daniel Donoghue.

At a recent meeting of the town's finance committee he said the cut will reduce the cost per student from \$20,000/yr to around \$12,000.

The financial cut of 40% was not documented with specific figures but Donoghue said it was common experience that when the costs of major items were reduced, such as the computer, equivalent reductions could be made in the teaching area. He said the finance committee could expect a 40% reduction not only in the hardware costs, but also in instructional costs.

Donoghue explained that for the past two-and-a-half years the school had been planning for a computer system which would be big enough to handle all the data processing needs of the towns in the area including school scheduling, assessing and police work.

But the four towns involved — Framingham, Holliston, Hopkinton and Ashland — have not been "beating the regional school's door down" to obtain computer services.

## 370/115 Configurations Reported Quoted in Spain

MADRID, Spain — Representatives of IBM World Trade have reportedly quoted two 370/115 configurations to potential users in Spain.

The first system included a 32K CPU with a 300 line/min. printer, 250 card/min card unit and 30M bytes of on-line disk storage for \$5,000/mo.

The second system included a 64K CPU with 500 line/min printer, 200 card/min reader and 60M bytes of on-line disk storage for \$6,800/mo.

The prices were converted based on current U.S.-Spanish exchange rates. IBM World Trade would not comment on the report.

## On the Inside This Week

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## VS Users Get Multi-370s, OS Upgrade

By Ronald A. Frank  
and Don Leavitt

Of the CW Staff

WHITE PLAINS, N.Y. — IBM has added a multiprocessing capability to the upper end of its 370 series to allow the integration of non-virtual 155s and 165s with new 158MP and 168MP mainframes.

IBM has a broad-based array of new software support for the 370 virtual storage users. Despite the new features, however, the keynote throughout the announcements is compatibility with the users' existing applications programs.

A multiprocessing configuration can be based on 155, 165, 158MP (for multiprocessing), 168MP and the larger models of the 145. Memory capacity on the 145 was doubled to 1M byte.

OS/VS2 Release 2 was enhanced to control the multiprocessor versions of the 370, through a variation of the Attached Support Processor (ASP), originally announced for System 360.

### Updated IMS/VS

Data base/data communications operations under VS are expected to be made easier by the introduction of updated versions of Information Management System (IMS/VS) and Customer Information Control System (CICS/VS).

OS/VS2 is the original VS operating system for OS/MVT users. OS/VS2 Release 2 includes a component called Job Entry Subsystem (JES3), based on ver-

(Continued on Page 4)



(Photo by Dave Chare)

Robert Sennet, representing the Society of Professional Data Processors, has the attention of the Computer Foundation meeting. Sennet sought the necessary time for proper organization.

## Societies Rally to Support Computer Foundation Plan

By Alan Taylor  
Special to Computerworld

CHICAGO — Many data processing societies have promised to support the Computer Foundation proposal of the Data Processing Management Association and the Association for Computing Machinery put forward at an open meeting here recently. The foundation plan is to take over the operation of the Certificate in Data Processing (CDP) and Registered Business Programmer (RBP) examinations from the DPMA this summer, and to operate them and other forms of practitioner certification and research.

Support promised by the societies was toward the cost of developing a final

incorporation charter in time for the proposed transfer of the programs to the foundation, on July 1 this year. It amounted to \$1,000 per society.

During the meeting, hosted by DPMA, it was explained that an estimated \$11,000 would be needed for organizational expenses prior to the incorporation. This included the costs of providing separate office facilities outside those available from either the DPMA or ACM.

Fred Harris, ACM cochairman, explained this had been done to avoid any possible suspicion that either ACM or DPMA was in control of the foundation or had decided in advance on the details

(Continued on Page 2)



(Photo by J. Mourreau)

Computerworld Publisher Patrick McGovern leads the Computer Caravan to Boston.

## Caravan to Begin in Boston

By a CW Staff Writer

BOSTON — With an expanded user program and 50% more exhibiting companies than last year, Computerworld officials are making last-minute preparations for the Computer Caravan, which begins its 10-city tour here next week.

More than 50 companies will be exhibiting the latest in hardware, software and services, covering virtually every aspect of computer usage, according to Neal

Wilder, national sales manager for the caravan.

Additionally, five panel discussions, 11 workshops and a tutorial on data communications planning will be conducted in each city.

Local computer users will be featured in all panels and workshops, and consultant Gilbert Hoxie of Booz, Allen & Hamilton, Inc. will travel with the caravan and

(Continued on Page 3)

## IBM/CDC Deal—It's 'Curiouser'

By E. Drake Lundell Jr.

Of the CW Staff

"Curiouser and Curiouser" —

Alice of *Alice in Wonderland*

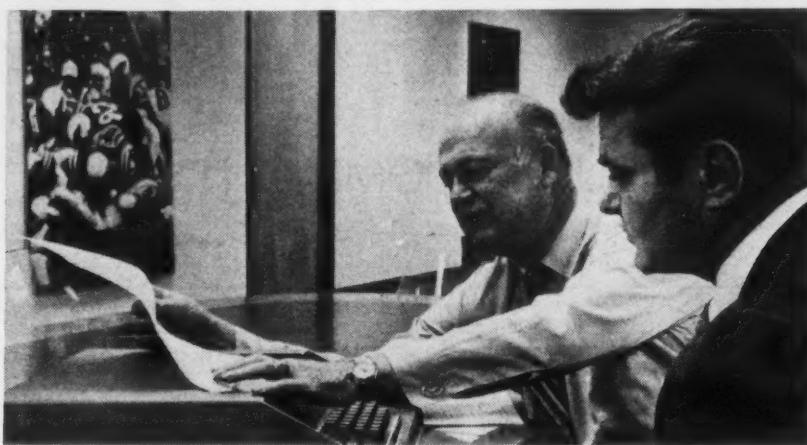
MINNEAPOLIS — Court actions here and in New York over the past two weeks have left many observers feeling like Alice as the argument over the deal between IBM and Control Data to destroy an important computer-based index has reached new heights.

Not only did the Justice Department join Telex in opposing the index destruction, part of the IBM/CDC suit settlement, but also Judge Philip Neville here ordered IBM and Control Data to refrain from destroying any further documents while he considered the Telex motion to have Control Data reconstruct the index.

In his order to the two parties, Neville said: "This is clear. Control Data is under injunction from this court as of now; IBM is under injunction from this court as of now not to destroy another document, not to move, transfer, give back or otherwise deal with any documents until we resolve this issue that's now pending before the court.

"I don't want to make a hollow proceeding of this and discover if I make an

(Continued on Page 6)



CW Photo by Leslie Flanagan

## Where Will He Be in '73?

Some teams during last week's college football draft had a little extra going for them. Herman Ball, director of player personnel for the Philadelphia Eagles, and Jack Butler (foreground), director of Blesto-VIII, the combined scouting organization of the Bears, Lions, Eagles, Steelers, Vikings, Colts, Dolphins and Bills, use printouts of vital statistics of the players to help with the choices. The 1030 Teletype printer from Computer Devices, Burlington, Mass., was located at the Eagles' stadium and accessed the University of Alabama's Univac time-sharing system which contained the vital information on the players.

## Societies Rally to Support Computer Foundation

(Continued from Page 1)

of organization.

This is for the computer community, DPMA cochairman John K. Swearingen pointed out in his opening remarks. "It is now up to the profession to decide how it should be run, and this is what we have invited everyone to hear about."

DPMA Council Continues

The organization suggested in the papers distributed at the meeting would con-

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EDITORIAL OFFICES: 797 Washington St., Newton, Mass. 02160. Phone: (617) 332-5606. TWX: 710-335-6635. Europe: Computerworld, c/o IDC Europe Ltd., 59 Grays Inn Rd., London, W.C.1, England (01-242-8908).

Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160. © 1973 by Computerworld, Inc.

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25 cents a copy; \$9 a year in the U.S.; \$10 a year in Canada; all other foreign, \$25 a year. MARGARET PHELAN, circulation manager. Four weeks' notice required for change of address. Address all subscription correspondence to circulation manager, Computerworld, 797 Washington St., Newton, Mass. 02160.

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## Many DP-Related Problems Rank High on Congress Agenda

By E. Drake Lundell Jr.

Of the CW Staff

WASHINGTON, D.C. — Computers and computer-related problems will be a major topic of discussion in Congress this year as that body takes up a wide range of DP issues centering on the protection

vacy.

And on the CBS program "Face the Nation" Senate Majority Leader Mike Mansfield (D-Mont.) promised a "very, very thorough" investigation of the data-bank activities of the FBI, Army and other government agencies, especially as they relate to political figures. Sen. Sam Ervin (D-N.C.) will head the investigation of these activities.

### Guard Dissemination

The first bill introduced on the subject was placed in the hopper by Rep. Don Edwards (D-Calif.) as H.R. 188 to "provide for the dissemination and use of criminal-arrest records in a manner that insures their security and privacy."

Basically, the measure would prohibit the distribution of arrest-record information on persons not convicted of crimes. At present the FBI's Computerized Criminal History system allows the distribution of records on anyone arrested for a crime, whether convicted or not.

Rep. Edward Koch (D-N.Y.) also introduced two privacy-oriented measures.

The first, HR 665, would "protect the constitutional rights of citizens of the U.S. and prevent unwarranted invasions of privacy by prescribing procedures and standards governing the disclosure of information to government agencies."

The second measure, which would "provide that persons be apprised of records concerning them which are maintained by government agencies," was introduced last year by Koch.

On the Senate side of the Congress it is expected that the issue of computerized data banks will be discussed by the Office of Technology Assessment as well as the Ervin committee.

This new body, headed by Sen. Edward Kennedy (D-Mass.), was established last year to provide the Congress with assessments of the impact of technology on society at large.

In addition, the Department of Health, Education and Welfare committee studying the issue of a Universal Identifier (UID) will report on its recommendations sometime this year — and this report could prompt more congressional action or else call for the issuance of administrative guidelines for such a UID by the President or the department.

Hearings are slated this spring by Sen. Philip Hart (D-Mich.) on new proposals in the antitrust and monopoly field. One of the major industries to be investigated will be the computer field with all segments of the business invited to give testimony.

With the present settlement of the Control Data suit against IBM and the Justice Department activity against the industry giant, these hearings are expected to take on the importance that was lacking during the last session last year.

There will also be a spate of activities to try to reorient computer systems to what congressmen see as important social problems instead of the heavy emphasis on military systems. But even with this action, the military will still be the largest buyer of computer systems in the government.

Examples of this type of activity abound. Already introduced are proposals to establish a national computerized Fire Data System, a computerized Environmental Data System, a computerized National Research Data System and several proposals to have the National Science Foundation support computer projects aimed at civilian needs.

The most ambitious of these is the National Science Policy and Priorities Act of 1973, sponsored by Senator Kennedy. It would give the National Science Foundation \$110 million over the next three years for computer-related projects to improve public services in areas such as health care, housing, transportation, pollution control and education.



(Photo by Dave Chare)

John K. Swearingen, DPMA, and Fred Harris, ACM, cochairmen of the Computer Foundation Organizing Committee, preside over the public meeting.

respectively. If the full \$11,000 support from the societies is not raised, this could be reduced to \$9,000 to repay loans from ACM and DPMA.

The foundation is expected to widen its certification activities beyond those operated by DPMA. One list of needs required by a selected Certification and Testing Advisory Committee was that data processing management, operations research, business systems, business programming, scientific programming and computer systems should all have programs with one common objective — to recognize the individual as an accomplished, competent practitioner.

The certification programs should look, according to the ACM/DPMA organizing committee, for a body of knowledge, high intellectual content, pride of contri-

### Moo . . . 6785 . . .

BOZEMAN, Mont. — Two Montana State University scientists may have solved the rising problem of cattle rustling out West. Dr. John Hanton, associate professor of electrical engineering, and Harley Leach, a research engineer, have produced a transistorized capsule which is ingested by a calf exactly three hours after birth. The capsule, which is heavy enough to remain in the cow's second stomach, emits an electronically receivable coded signal. The signal includes a registration number which can be entered into a computer to identify the animal's owner.

# Caravan Begins Its Trek

(Continued from Page 1)

deliver the communications tutorial, reported Edward J. Bride, forum manager.

After Boston, the caravan visits the following cities, in order: Washington, D.C., New York, Atlanta, Houston, Anaheim, San Francisco, Kansas City (Mo.), Chicago and Cleveland.

During 1972, its first year, the caravan was attended by more than 18,000 users, plus representatives of various exhibiting companies during a nine-city tour.

For 1973, caravan officials have predicted an attendance of upwards of 30,000.

## Planning Ahead

As of last week, registrations were being received for the first four cities on the tour, and caravan officials advised advanced registration would avoid lines and reduce the possibility of missing sessions. Officials said about half the forum sessions would probably be sold out, meaning about 400 users per day for these sessions.

Forum panelists will represent nearly every facet of the computer community, including business, education and government, Bride reported.

The only segment of the community not on the user panels is the computer industry itself; some exhibiting companies will be presenting special seminars oriented toward their particular product or service, but this is separate from the

## Colby College to Develop Resource Allocation System

WATERVILLE, Me. — Colby College has been awarded a \$56,500 grant by the Research Allocation Management Program (Ramp) of the Esso Education Foundation, New York, to develop a basic computer-assisted system for the planning of resource allocation.

Colby President Robert E.L. Strider said the contract for implementing the project has been awarded to Systems Research Group, Inc., a Toronto firm which has been working on a comprehensive information system master plan for Massachusetts State College's 11 campuses.

Development of a plan for resource allocation is aimed at providing transactional and statistical data including projections of trends, consequences of alternate choices, and analyses of costs, physical plant use and personnel requirements.

forum program, Bride explained.

In each city, the opening day is devoted to data entry, with four workshops on keypunch replacement, OCR, intelligent terminals and direct (on-line) data entry. Hoxie's tutorial is given during the afternoon, in an open, general session.

On the middle day, data communications is the panel theme with workshops on data transmission and equipment selection.

On the afternoon of the middle day, a panel on software evaluation will be held. Installation management is the theme on the third day, with workshops on personnel selection and training, programming management and independent peripherals. In most cities, two users will share the independent-peripherals workshop, one to discuss core and the second to discuss other peripherals.

On the afternoon of the third day, the open session will feature a panel on the use of small computers in a business environment.

## It's the Concepts That Count Here

LAFAYETTE, Ind. — A Purdue University engineering professor has developed an examination format which he hopes will help upgrade the quality of math and engineering courses and so improve students' ability in those areas.

The test, designed by Prof. Thomas Boyle, is graded by a CDC 6500 which provides the student and his instructor with an analysis of the student's strong and weak areas.

The computer can do this because each test is divided into subtests, each of which tests a very specific area of knowledge. For example, a very elementary math test might be divided into four subtests — addition, subtraction, multiplication and division. The computer's analysis may show the student is good at addition and subtraction but weak in multiplication and division. He can then study the weak areas and repeat the test.

The test differs from ordinary programmed instruction and traditional

tests in that the student is not told which specific questions he answered wrong. Doing this would not allow the student to repeat the test since he could memorize the answers without really learning the underlying concepts. With Boyle's method the tests can be repeated until all the material is learned.

Boyle hopes to put the tests on-line using remote terminals. Under this system the student would receive his analysis immediately after completing the tests.

The test has been used successfully in freshman math and engineering courses at Purdue, Boyle said. It is administered at the beginning of each course to let the student know what areas of competence are expected of him. It is then given throughout the course to monitor the student's progress.

Purdue's Measurement and Research Center plans to market the test to high school math teachers nationwide.

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# VS Users Get Multiprocessor 370s and OS Upgrade

(Continued from Page 1)

sion 3 ASP, which permits peripheral devices to be pooled by all systems in a multiprocessor complex, IBM explained.

Under JES3, tapes and direct access units can be shared by as many as eight separate computers. Card I/O devices and printers in a multiprocessor complex are typically assigned to the controlling CPU, the company added.

OS/VS2 Release 2 also provides multiple address spaces which, IBM said, may result in the number of concurrent online applications, because in a terminal network each user can access 16M bytes of virtual storage.

Vtam provides dynamic linkage between an application program and a terminal, at the request of either, and until either relinquishes control.

Vtam will become a part of each of the VS operating systems, at no cost to the users, and this should ease conversion of application programs from a DOS to an OS environment, IBM said.

The VS versions of IMS and CICS appear to answer some of the problems the early users of OS/VS1 had trying to trade off low activity rates with high real-core requirements. Unless the control programs were maintained in real core, these users found response times degraded badly due to paging overhead.

With IMS/VS and CICS/VS, "less real core may be required" to support these applications in a virtual system, according to an IBM spokesman.

OS/VS2 Release 2 is scheduled for March 1974 at no charge. NCP/VS is likewise a free item, expected to be available in November of this year. At the same time Vtam, another "freebie," will be ready for DOS/VS users. It will be available to OS/VS1 installations in February 1974, and to OS/VS2 Release 2 users in June of next year.

CICS/VS is scheduled for delivery in

January 1974, under a license agreement at monthly charges of \$750 for OS/VS users and \$350 for DOS/VS users.

IMS/VS, which is compatible with IMS Version 2, will be ready for OS/VS users next February under a license agreement at monthly charges of \$700 for the data base system, and \$850 for the data communications system.

The multiprocessor configurations provide some new options for 155 and 165 users who have non-virtual systems. Both of these mainframes can operate in a multiprocessor system although they cannot be used as a control computer.

A control CPU interfaces the multiprocessor configuration to "the outside world," and handles the job scheduling for up to four CPUs that can be included in an MP system.

Two types of multiprocessor systems, loosely coupled and tightly coupled, can be configured. A tightly coupled system includes two 158MPs or two 168MPs connected with either a 3058 or a 3068 multisystem unit. These multisystem units include a control panel and act as a processing switch between the two CPUs.

The loosely coupled systems can include a mixture of 155s, 165s, 158s, 168s and the largest 145s. Only a virtual machine can act as the control CPU in this type of configuration.

## Uniprocessors

Any installed 158 or 168 systems, now called "uniprocessors," can be field-upgraded to MP versions "in a matter of days," IBM said.

In a tightly coupled system, both CPUs, each with its own main storage and I/O equipment, can run concurrent while processing different applications or the same job. The MP CPUs contain "architectural extensions" for the MP mode including time-of-day synchronization, IBM said.

Monthly rental for the 158MP ranges

from \$108,000 with 1M characters of storage to about \$200,000 for 8M characters. The 168MP costs \$260,000/mo with 4M characters and \$370,000/mo with 16M characters.

Purchase prices on the 158MP range from \$5 million to \$9 million and on the 168MP range from \$11.4 million to \$16.2 million. First deliveries will be in March 1974.

## 3704 Uses Vtam, NCP/VS for TP

IBM also introduced the 3704 communications controller which is a scaled-down version of the earlier 3705. The 3704 can handle up to 32 low-speed lines compared to a maximum of 352 on the 3705.

A 370 virtual systems teleprocessing capability, called Virtual Telecommunications Access Method (Vtam), will allow users to share communications lines among terminals and applications programs eliminating the need to dedicate each line to a specific teleprocessing application and terminal.

Communications users will also be able to operate concurrently in both emulation (270X) mode and network control mode with the Network Control Program/VS available at no charge on virtual 370 systems.

Both the 3704 and 3705 will now be able to operate as remote network concentrators collecting data from low-speed terminals and sending it over higher speed to the main CPU.

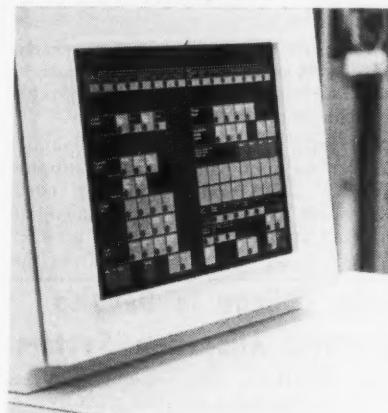
Two features enable either the 3704 or 3705 to operate as remote processors. A duplex or half-duplex communications interface is required. The duplex version handles a two-way link between local and remote 3704s and 3705s at speeds up to 7,200 bit/sec. The duplex interface costs \$124/mo per line on the 3704 and \$106/mo on the 3705.

The second feature is a remote program loader that enables a mainframe to load the Network Control Program into a 3704 or 3705 over a communications

line. It costs \$176/mo on the 3704 and \$235/mo on the 3705.

The 3704 can operate with most 360s and 370s and can support IBM terminals including the 1050, 2740 series, 2780 and 2790, 3270, 3735, 3780 and the 3741 diskette system on virtual CPUs only.

The 3704 is available under the extended-term plan two-year contract at monthly rental prices ranging from \$740 to \$1,630. Under the standard rental agreement the 3704 costs from \$870 to \$1,900/mo and purchase prices range from \$35,000 to \$90,000. First deliveries of the 3704 with the emulator capability are scheduled for May 1973.



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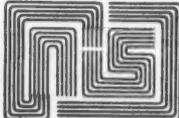
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## Judge Acts to Save Documents

(Continued from Page 1)

order 10 days from now that then [a Control Data lawyer] gets up and says 'we didn't know, we sent back all the documents; and I'm not going to let you do that, and you're under injunction not to do that, and IBM is under injunction not to destroy any documents it has.'

Telex argued that the destruction of the index violated a pretrial order by Neville that CDC "will make available to counsel for Telex all IBM documents in its possession and its so-called data base or index."

"Our objective is not really to thwart the settlement; our objective is not to cause this settlement to be blocked and the case reinstated," the lawyers admitted.

Rather, they said, they had filed the motion in order to get IBM and CDC to live up to the court ruling that required that Telex have access to the index of the documents in the case.

In addition, the Telex lawyers said Telex "would be greatly handicapped in a trial of this case if deprived of the data

base or index which this order provided for... It is our position that we will suffer substantial detriment, substantial prejudice.

"In short," the Telex lawyers said, "these parties in the settlement of this suit have taken it upon themselves, for reasons perhaps best known to them, to insure the prompt destruction of this index and data base. It was provided for in the terms of the settlement itself; it was done promptly, precipitously..."

"This information, we are told, is no longer available to us unless your honor direct that Control Data reconstruct this data base and make it available to Telex," they concluded.

In reply, IBM and CDC argued the destruction of the data base or index did not violate the order and the index would not be useful to Telex anyway.

IBM and CDC also argued that the order did not give Telex rights to the index forever and that Telex had suffered no material injuries by the file destruction.

There were differences, however, in the

## Will Justice Renew Attack...With Vigor?

The angry filing by the Justice Department last week over the destruction of the index to documents in the IBM/CDC case may be a manifestation of a new hard-line attitude by the government.

Reliable sources reported last week that the Nixon Administration has finally given the go-ahead to press the case with all possible speed and resources.

This move, it was said, helped back the Justice Department contention

court over whether the destruction of the index was part of a "secret deal" between IBM and CDC, as charged by many observers of the case.

Telex attorneys charged that a lawyer for CDC, Michael Berens, had told them the "terms of the settlement... required this data base or index be destroyed," and asserted that the "index was one of the most important negotiating leverages that CDC had in negotiating the settlement that was made."

However, the CDC lawyers said the de-

struction "was not a condition, it was an understanding of the settlement," and the IBM lawyers agreed the index destruction was not part of an agreement but was understood between the parties.

The CDC lawyers also indicated the settlement would allow Justice to bring its case to trial earlier, since there would not be any conflict with the trial in the CDC case.

However, Neville noted pointedly that "your destruction didn't help them any."

When an IBM attorney was questioned on why IBM wanted to destroy the index, he replied that "we wish there be peace between CDC and IBM, and it would be inconsistent with such a peace to have the person who had been your enemy continue to supply an arsenal against you."

Another IBM attorney, however, indicated that one of the first things discussed in the initial meeting on a settlement was the index and files of documents compiled by CDC.

## Brief Asks IBM To Reconstruct Index

NEW YORK — In its filing with the court here, the Justice Department's extensive brief on the destruction of the index to the documents in the IBM/Control Data case contains some of the sharpest language yet from government attorneys.

It asked that the court compel IBM to either reconstruct the data base or index; pay the Justice Department to do the same thing; or give the Justice Department access to the IBM data base of the documents in the case.

It is estimated that it would cost the department \$4 million to reconstruct the destroyed index — all of which would have to be paid by IBM if the government is successful.

The Justice Department contends that the destruction of the index violated pretrial order number one, issued by Judge David Edelstein, which requires that both the Justice Department and IBM "secure from destruction all records of any kind which relate in any way to electronic data processing."

Justice's motion, in addition to requesting that IBM pay for reconstruction of the index, asked the court to order IBM to produce all records relating to the CDC settlement and to allow Justice to subpoena all representatives of IBM and CDC who took part in the negotiations.

In a new twist, Justice also asked the court to issue an order prohibiting the defendant "IBM" from disposing of any of its assets, wherever they may be located other than in the transaction of normal business, until the case is settled.

This is seen as a move to prevent IBM from trying to dispose of some of its assets while the case is under consideration, legal forces said.

The government motion noted the government had been making use of the data base and it had often told the court and IBM it would be using the file in preparing for its case. The destruction, Justice said, would handicap the government's case and delay the trial in the case.

It charged that IBM exercised control over the documents because of its payment of \$15 million to CDC for legal work in the case and because IBM lawyers were present when the data base was destroyed.



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## Editorial

### Apologies Are Not Enough

The explanation by IBM that the political pressuring of a State of Delaware official was just a misunderstanding is inadequate. As evidenced by letters from readers, many people believe that such action is quite usual across the country. The IBM apologies under this circumstance, far from ending the matter, indicate the corporation is aware that selling tactics reportedly being used are in fact blameworthy.

The matter is made more serious because it is so easy for computer salesmen to attack the competence of DP managers. All new computers have some sort of a selling gimmick — such as virtual storage. As part of the selling process the company produces "virtual storage experts," who at the drop of a hat can lecture on the unprecedented values of the gimmick, the amount of research needed to bring it to the market, etc.

From the experts' testimony it is easy for a marketing man to say to the DP manager's boss, "You will have to get a competent virtual storage man — you need one with your new computer."

Effectively, what has been said is that "your current DP manager is incompetent" and unable to keep up with the pace of development. The point, once introduced, can be reiterated whenever the DP manager fails to respond to the salesman's suggestions with appropriate enthusiasm.

If IBM marketing is to obtain the leadership and trust that IBM equipment has won in the past, the same positive actions to prevent any suspicions of pressure tactics being used will be necessary.

To start with, the IBM salesmen could make it a rule not to pay calls on the company president, or other officials without having the DP manager present. That could be instituted as corporation policy, as branch policy, or simply by the individual salesman.

It would mean a great deal more to the DP manager trying to serve his employer's interest honestly than any apologies could ever mean.

### RPG II -- Wave of Future

By N.M. Demos

Special to Computerworld

For the average commercial data processing installation, Cobol is, or should be, obsolete. The wave of the future, fast becoming a reality, is a language with an internal logic structure. The best example of this type of language in wide use today is RPG II.

RPG II is a true fourth-generation language. First we

### Viewpoint

had machine code, then one-for-one assemblers, then machine-independent (theoretically), user-oriented languages, now the time for a more powerful tool has arrived. Note the following:

- The internal logic flow of RPG II relieves the programmer of much coding and debugging.
- RPG II is terse, easy to code.
- RPG II compiles very quickly and efficiently.
- RPG II, with its internal logic flow, makes program standardization partially automatic.
- RPG II, with a minimum of coding conventions, provides excellent documentation.
- RPG II source code can be automatically converted into quasi-English statements if desired.

Several enhancements of RPG

II are needed to make it a true all-purpose application language. Some that come to mind are:

- Work file capability; this could be implemented by a "CLOSE" verb.
- To save core, a method of processing (without look-ahead) directly from the record input area.
- A method of converting switch settings to array values. This could be done by a compiler-defined array, each element of which would be a switch setting.
- Compiler logic so that if there were more than one input file, without matching records, the input areas and routines would be overlayed by the next input file.
- A user-controllable overlay structure.
- The capability to code subroutines as separately compilable modules.

A thorough understanding of RPG II logic flow is a prerequisite to effective use of the language and is the major reason for its lack of wide acceptance on IBM 360s and 370s.

RPG II is not the low-level report generator of its predecessors. RPG II or a language of its type represents a breakthrough into a better cost/performance ratio for a programming staff.

## 'A Mutual Understanding'



### Organizing Installations

## 10 Commandments for Teamwork

God gave Moses 10 commandments for guiding our lives, so 10 should do for organizing our installations.

The American Management Association suggests the following 10 (from Dale's *Planning and Developing the Company Organization Structure*):

- Each employee should be assigned definite and clearcut responsibilities — Everybody's business is usually nobody's business, so you may want to ask certain operators to be responsible for specific systems. You may also want to apply this in your systems and programming areas, so each person maintains particular systems in addition to developing new ones.
- Responsibility should always be coupled with a corresponding authority — Allow someone to grab your authority and you will pay for it, since you remain responsible. Aggressive users will sometimes try to impose processing priorities, and programmers are often tempted to test and debug via batch processing at their convenience.

These actions could upset the overall production schedule. If you allow others to preempt your authority, you remain responsible for the results. This "responsibility equals authority" equation is reversible, so that authority is accompanied by equal responsibility. Accordingly, input offices are responsible for when you get the input documents and for their accuracy.

• No change in the scope or responsibilities of a position should be made without a definite understanding of all persons concerned — When a person is promoted he often has trouble letting go of his old job and may interfere with the new incumbent. An operations manager

### Management

By Frank Greenwood, PhD



who has been moved up, for example, will probably have to be told to stay out of day-to-day operating matters (several times).

- No supervisor or employee, occupying a single position in the organization, should be subject to orders from more than one source.

• Orders should never be given to a subordinate over the head of his supervisor. If the supervisor is ineffective, replace him, don't bypass him — Ignore this and you dilute the authority of a supervisor, thereby weakening the organization your living depends on. For most routine matters, however, anyone having legitimate business with another should contact that person directly (i.e., without going through the chain of command).

- Whenever possible, praise your subordinates for a task well done. However, if you must criticize your subordinates, do it privately. Never criticize in the presence of associates of equal or lower rank.

• No dispute or difference between supervisors or employees as to their authority or responsibility should be considered too trivial for a prompt and careful adjudication — When someone comes to you grumbling about his boss, tell him to go back and settle it with his superior. Add that if he cannot settle it equitably, he is entitled to come to you, but that his boss must also be present. Then, if you three cannot solve the problem, all three will go to your boss.

• Approval for promotions, wage changes and disciplinary action should always be obtained from the supervisor immediately above the one responsible for the action — This policy tends to ensure that decisions are not made on an emotional, subjective basis, thus avoiding situations such as when the night shift supervisor "ran off" the operator and hired his neighbor, thereby getting free transportation.

- No employee should ever be required to be, at the same time,

an assistant to and critic of another — A programmer cannot remain loyal to the lead programmer and at the same time criticize him before the manager upon which your living depends. But, a programmer may evaluate a set of facts and arrive at a judgment that differs from that of the lead programmer.

Up to the time the lead programmer takes an official position, the programmer should usually be free to disagree and to push his own views in a sensible fashion.

After the lead programmer takes an official position, however, the programmer should normally fall into line and implement the decision as if it were his own.

• Every employee should be provided with an evaluation of his performance on a regular basis, both to enable him to maintain a high standard of performance, and, where necessary, to provide guidance in ways of improving his performance — Probably toughest of the 10, this requires that you involve individuals in defining their own jobs and expected results and that employees participate in the installation's decision-making. It also requires that people have considerable freedom about how to achieve their objectives.

When you are doing these things, you and your subordinates are in a position to mutually agree on how performance has compared to expected results.

The above guidelines should help achieve the voluntary cooperation of the people you supervise. Creating and developing voluntary cooperation is critical to you because no matter how powerful a combination of money, machines and materials you control, it is dead without a team of willing, thinking and articulate people to make it work.

Frank Greenwood is computer center director at the University of Montana.

## Baby of 360s Comes of Age

# On Its 8th Birthday Model 30 Achieves Independence

The IBM 360/30 has always been an unusual machine, sometimes seeming to have quasi-human characteristics. For instance, it was in January 1965, just nine months after it was announced by its proud parent, that the system was delivered and its real power unveiled.

To many of us January appears to be a sort of birthday in the life of the machine. The first showing of the vital "1401 compatibility" feature could be compared to a gathering of guests for a child's christening, with prognostications of the fortune of the new infant, worries about the health of its relations, and talk of how the family fortune might now be carved up between the newcomer and its yet-to-be seen brothers.

The chief topic of conversation was whether the hardware compatibility feature would really work and be as successful as IBM claimed.

When the news of the feature had first been announced there was no doubt that IBM would succeed, but during the three months prior to the showing industry observers developed a greater understanding of the problems involved as a result of experience with another hardware/software compatibility case.

The doubters were out in full force, and were well-armed with facts, while the defenders could only respond with press release-backed assurances.

### Fuel For The Fire

The facts which fueled the doubtful speculation came from the discovery that many IBM 1401 systems were quite different from each other. During the previous two months, hardly a week passed by without revealing some new and different 1401.

Often the news came from IBM contacts who passed on the information that ABC Corp. was trying to use the Honeywell Bridge or Liberator concepts to put their 1401 programs onto a Honeywell 200, but they were not working.

Tales of Honeywell experts flying around the country trying to put out the fires were widespread, and the fact that the 1401 manuals left out many important details on the operation of the system was becoming apparent for the first time.

It was the existence of different versions of the 1401 — which was revealed by the problems of the Honeywell Liberator program — that provided the facts for the

**The Taylor Report**  
By Alan Taylor, CDP



doubting Thomases at the showing of the Model 30.

### Baby Shows Its Stuff

But the Model 30 was well vindicated. The power of its punched card microprogram to be easily changed to suit the particular 1401 system was demonstrated time and time again. The system showed its power but like any baby at a christening, the potential of that power was a mystery for the future.

Now, eight years later, we are beginning to see just how powerful the Model 30 is. Only a year ago, on another January day, a Model 30 champion [Advanced Memory Systems] took IBM to court to force the firm to provide proper maintenance for its threatened offspring.

During the past year, the partial independence of the 30 has been demonstrated in many places where additional core has allowed users to run programs that did not previously fit into the system, to use partitions which were not available before, etc.

### Eight Years Strong

This January the Model 30 celebrated its eighth birthday with still stronger signs



(Photo by Don Tice)

Frank Pawelski of CHCS shows Alan Taylor the empty spaces on the second logic gate of the Model 30. CHCS reinstalled second gates, which were removed from the IBM design during the changeover from Version A to Version B of the Model 30, and is using the gates to hold the additional logic of its accelerated system.

of life. Computer Hardware and Consultant Services Inc. (CHCS) introduced its accelerated Model 30, which has much of the power of a Model 40 and can use four times more core than the standard Model 30.

To do this, CHCS had to put back a feature IBM had eliminated in the early stages of the 30. As originally designed, the Model 30 was a two-gate system, with

logic capabilities on both gates.

Most of the logic was on the A gate, which is in front of the B gate. The B gate contained some small amounts of logic such as the storage protect feature, but was mainly present for later enhancements that would increase the power of the system during its marketing life.

One of the planned enhancements was a high-speed multiplexer channel, and quite a few wires could be seen leading to its apparent predesignated position.

However, the channel was never released. Instead, the Model 30 was redesigned and the second gate was dropped, a move which greatly limited the available room for expansion.

Perhaps someone at IBM realized just how powerful a competitor for its next series of computers the Models 30 would be, or perhaps a value analysis simply showed there was no need for a gate to be installed. I don't know what happened, but the gate vanished.

Now, however, the gate is back — together with its implied promise of facilities to expand the usefulness of the system. (A conservative estimate of the life of the Model 30 is at least 15 years, so there is plenty of engineering capability left in it.) CHCS has installed the second gate for its new arithmetic unit and other equipment.

So now, at the eight-year mark, the Model 30 is showing a surprising resili-

ence. Although it has been under death sentence from the marketing area for years, its achievements are increasing almost monthly.

### Bon Voyage

What the power of the system will be next year at this time I cannot guess, for the Model 30, supported by a host of champions, has set out on an independent voyage. Boosted by additional core, guaranteed maintenance and improved timings, the Model 30 can give its users the best performance its engineers can maintain, without being held back by the pressures of marketing philosophies or the financial interests of its manufacturer.

Come what may — wreck and the destruction of the high hopes many of us now have, or fortune and the achievement of new peaks in price/performance — it will be an interesting voyage.

To the liberated Model 30 and its champions go my best wishes for fair-weather, fine sailing and a happy return. I ask you to look after the eight-year old now in your care, for the computer community can be greatly served by its powers in the future.

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## DPers Must Answer Charges

dismissed.

Some of the comments received were: "Under no circumstances. Why should this profession only be exempt from criticism?" — Sidney Golder, Framingham, Mass.

"The DP profession is not entitled to

### The Readers Respond

refuse to give serious consideration to any charge of abuse." — R.T. Haugel, South Bend, Ind.

"When it is obvious that the allegations are excuses rather than fact!" — D.L. Steen, Findlay, Ohio.

"When allegations are not backed up with evidence, facts, etc." — Richard Bator, Nabnasset, Mass.

"Only if the complaint or alleged abuse is an isolated case, or is just plain unreasonable." — Leo Murlowski, Minneapolis, Minn.

"When the allegation cannot be substantiated." — William Forsythe, Cleveland, Ohio.

## Letters to the Editor

### IBM Forces' Customers To Buy Systems Blind

IBM, preceding the announcement of its 370 line, kept telling its customers that the machines of the future would be "virtual-memory machines."

Its salesmen and technicians announced that equipment of the future would have paging, spooling, cascading and such systems would have the necessary index registers necessary to perform virtual-memory tasks. IBM's initial announcement and deliveries of its 370/155s and 165s did not include any software associated with this new generation of computers.

The promise of the IBM 370 was implied, but not spoken, in the press. Few companies the size of IBM, with its power, political influence, market control, leadership and logistic knowledge

offered less to the user than would a charlatan with "caveat emptor" furnish these users who are unwary and have been cultivated to the point of being able to be duped.

Upon delivery of the IBM 370/165s and 155s, IBM sold a greater percentage of its rental base than ever before. It even had the gall to raise prices on such computer systems prior to initial deliveries and force them to be taken by purchasers.

Then came the true story of virtual memory.

IBM taught its major purchase customers that they should no longer purchase IBM computer systems. The IBM 370/155 and 165 are not virtual-memory machines!

Today, IBM is not saying that virtual memory will perform at this performance level on your virtual-memory application and throughput.

The customer may be allowed to

"benchmark and make his own decision." Few have the availability, staff and time to benchmark their requirements.

Again, like the image of justice, the IBM customer is forced to buy computer systems blind.

The superbrains within IBM are again attempting to say that the knowledgeable customer has sufficient facts to make his rent or buy decision.

IBM's logistics, as proven under the Control Data suit, will never reach the court of public opinion. Another deal will be made with the U.S. Justice Department alleviating IBM of all responsibility for creating a proliferation of oversold and overutilized computer systems.

The IBM "370 non-generation computer system" is an end to settlement of the IBM consent decree of 1974 and total control of the computer marketplace.

Thomas E. Doyle  
Summit, N.J.

### Is Your Rear End Dragging?

Computerworld carries numerous articles relative to front-end support. But what I'm interested in is rear-end support — mine always seems to be dragging.

Do you expect to publish anything on this in the future?

Will Perry  
CDP

Dallas, Texas

Computerworld has scheduled an Output Supplement for the issue of October 31. Ed.

Computerworld welcomes comments from its readers. Preference will be given to letters of 150 words or less. Computerworld reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

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## Dangerous World of Computer Buying: Is It Love of Technology or Company?

By Michael Weinstein

Of the CW Staff

A company in Philadelphia recently was persuaded to upgrade to a large computer with "virtual memory" capabilities — but their programs were written for an IBM 1401. The net effect of

### Viewpoint

this "upgrade" was a multimillion dollar machine that was simulating the operation of the old 1401!

During the past year the company reported a loss of revenue that would have been turned into a substantial profit without the large upgrade.

While an extreme case, it does point up two areas where general computer operations fail. First, all too often computer people are more loyal to the technology with which they work than the company they work for and never do salesmen or company experts come forth to argue against large upgrades which are unnecessary.

These problems continue because nowhere is the separation of the company from the individual department more evident than in the computer room.

The DP manager all too often sees himself as the technological leader of society and becomes more enamored with the technology of his machines than with the fact that he works for a company with a set profit-making goal.

He tends to forget that most computer applications could be performed by "x" number of accountants or typists. The value of the computer is that it gets the job done quicker and more accurately.

It is the job of the DP manager to optimize this speed and efficiency — not to trailblaze into new technology.

This separation of computer department from company also allows the computer vendor's salesman to play one side against the other and eventually gain a commission on a new and larger system.

Sometimes studies appear when a user contemplates changing vendors. These surreptitious and supposedly well-meaning studies offer to help the company solve difficult problems before facing the added difficulty of choosing new equipment.

What should make this tactic suspect in every user's eyes is that a company has yet to recommend that a user buy another vendor's equipment. By definition these studies must be biased.

Large vendors are the main employment agencies of the industry. If a DP manager is "good" and follows the advice of his salesman, he has every right to expect that when he wishes to change jobs, help and recommendations will follow. But if he is classified as "unfriendly," no computer company will recommend a man for a job when his first task may be the replacement of that vendor's computers.

The other factor contributing to the problem is that corporate managers still look at computers as a mystical mathematical rite. They do not take the time to learn the basics of DP operation.

If management continues to be unwilling to learn, it will be left to the mercy of whomever it wishes to believe. Managers must learn their interests lie in the computer room and they should temper advice from a vendor with the realization that the salesman's main interest is to make a sale.

## Ombudsman Offers Potential to Use

By Shulom Kurtz

Special to Computerworld

For several years I've been a silent reader, but at this point I find I must raise a challenge to Alan Taylor with whom I generally agree.

Of particular concern is the matter of professionalism in the attitude of the practitioners of computer applications, a concept espoused by Taylor in a variety of ways. It was, therefore, surprising to read his apparently quite cynical view of the ACM ombudsman program [CW, Dec. 27/Jan. 3].

Although ACM undertook the operative side of the program under Walter Carlson's presidency, the original proposal came about as a joint action of DPMA, IEEE Computer Group (now the Computer Society) and the ACM, with endorsement by all three organizations.

The purpose of the program was never to undertake an active role as prosecutor. Rather, in an era when the layman's attempt to deal with a high technology is frustrated by a communications chasm, the ombudsman should

serve as the translator between the two — an objective fact-finder with no axe to grind, whose purpose would be to assist in finding the problem source to allow appropriate corrective measures to be taken.

As originally conceived, the ombudsman was not to establish

### Viewpoint

a new level of activity, but rather to work within the framework of existing organizations for consumer protection.

In practice it begins to appear that these organizations may not receive many complaints because people give up before being sufficiently aroused to proceed through formal channels.

This conclusion is borne out by Taylor's own columns discussing such items as the arbitrary system, the need for professionalism, etc. Taylor is sufficiently knowledgeable to carry his own case to the computer user, but unfortunately John Q. Public

often finds himself the "usee."

It is in this area where the ombudsman program offers great potential.

There is no doubt the most fundamental sources of these problems are in the realms of academia and computer vendors, as Taylor suggests. Data processing management must share the liability when it assigns unqualified personnel to systems design and programming and fails to exercise adequate supervision to assure that work is done to good standards.

The man whose credit rating is adversely affected now by a poorly implemented system is not concerned with anything but his immediate problem. It is at this level where the ombudsman functions. All three of the parent organizations — DPMA, ACM and the IEEE Computer Society — must address the basic problems.

The ombudsman program warrants the support of the entire data processing community.

Shulom Kurtz is ombudsman for the Rocky Mountain Chapter, ACM, Denver, Colo.

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# SOFTWARE & SERVICES

## Random Notes

### Manufacturers Get NCR Help Handling Inventory Control

DAYTON, Ohio — The Inventory Material Control (IMC) package just released by NCR for Century users with a minimum 32K storage, is flexible enough for job-shops, mass or batch-production operations, an NCR spokesman said.

Within IMC are subsystems for implementation and file maintenance, item analysis and cost control formulation, and allocation and stockkeeping control. Distributed without cost to Century users, the package can be used by itself or as the second part of an integrated system for manufacturers, which already includes a bill of materials processor.

### Sanders Adds 'Span' Software To 804 Terminals, 810 Clusters

NASHUA, N.H. — Users currently operating with IBM 2260/2265 CRT terminals can gain advanced editing and faster printing capabilities without breaking 2260 line disciplines, by shifting to Sanders 804 Stand-Alone or 810 Cluster terminals equipped with new software just announced by the company.

The "Span" software is bundled into the price of the hardware. The 804 stand-alone terminal is \$6,980 with lease prices from \$202- to \$245/mo. An 810 Cluster of eight terminals is priced at \$3,387/terminal, with leases ranging from \$94- \$115/mo per terminal.

### T/S Banking Programs Listed

PHILADELPHIA — A full range of banking and financial management programs are available through time-sharing networks and the capabilities of many of these programs are reported in detail in the latest of Time-Sharing Information Services' applications directories.

The *Banking and Finance* handbook sells for \$28, from 3401 Science Center, 19104.

### Fixed Asset Accounting Updated

SAN DIEGO, Calif. — Both 360/370 and Burroughs users can implement version II of the Fixed Assets Accounting System (FAAS) now available from International Inc., 620 C St., 92101.

The enhanced FAAS supports six methods of depreciation and flexible depreciation proration upon both acquisition and disposition of items controlled by the system. Calculation of investment tax credit is also part of the \$10,000 package, the company said.

### Correction

The correct address for M. Bryce & Associates, Inc., developers of the Pride package for system planning and development [CW, Jan. 17], is P.O. Box 15459, Cincinnati, Ohio 45215.

# For MMS General Ledger Users 1973 Will Be A Vintage Year.

Since January, 7 companies ordered the MMS General Ledger System. Each one of these corporations is worth more than \$20 million (one is in the \$800 million class). They all have the programming staffs and resources necessary to develop their own corporate financial systems. Instead, they chose the MMS General Ledger. A software package. Their reasoning is simple: it costs less to use a proven package (more than 50 users have installed it in the past three years). Also, it fits your needs rather than the other way around.

For these happy users, 1973 will be a vintage year. Call or send in the coupon today. Then get ready to join the celebration.

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# Computer Users' Forum Registration

Name \_\_\_\_\_  
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## 1. Please circle one number in each category.

(This information is necessary to provide a better forum for you.)

### YOUR INDUSTRY

- 01 Mining/Construction/Oil & Refin.
- 02 Manufacturing - Computer or data system hardware, peripherals/other associated mechanical devices
- 03 Manufacturing (other)
- 04 Utilities/Comm. Sys./Transport.
- 05 Wholesale/Retail

- 06 Finance/Insurance/Real Estate
- 07 DP Serv. Bureaus/Software/Plann.
- 08 Business Services (except DP)
- 09 Education/Medical/Legal
- 10 Federal, State and Local Govt.
- 12 Communications/Printing/Publ.
- 13 Other: \_\_\_\_\_

### YOUR FUNCTION

- 01 Corporate Officer
- 02 Data Processing & Other Operational Management
- 03 Data Processing Professional Staff
- 04 Consultant

- 05 Lawyer/Accountant
- 06 Engineering - Mgmt./Scientific/R&D
- 07 Sales/Marketing/Account Exec.
- 08 Librarian/Educator
- 09 Other: \_\_\_\_\_

## 2. Please check the appropriate city:

_____ Boston	Feb. 13-15 (Tues, Wed, Thur)	_____ Sheraton-Boston Hotel
_____ Washington, D.C.	Feb. 20-22 (Tues, Wed, Thur)	_____ Sheraton-Park Hotel
_____ New York	March 5-7 (Mon, Tues, Wed)	_____ New York Hilton
_____ Atlanta	March 13-15 (Tues, Wed, Thur)	_____ Regency-Hyatt House
_____ Houston	March 20-22 (Tues, Wed, Thur)	_____ Hyatt-Regency Houston
_____ Anaheim	March 27-29 (Tues, Wed, Thur)	_____ Disneyland Hotel
_____ San Francisco	April 3-5 (Tues, Wed, Thur)	_____ Civic Auditorium (Forums & Exposition)
_____ Kansas City, Mo.	April 11-13 (Wed, Thur, Fri)	_____ Del Webb Towne House (Hotel Rooms)
_____ Chicago	April 17-19 (Tues, Wed, Thur)	_____ Municipal Auditorium (Forums & Exposition)
_____ Cleveland	April 24-26 (Tues, Wed, Thur)	_____ Muehlebach (Hotel Rooms)
		_____ Conrad Hilton Hotel
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		_____ Sheraton Cleveland (Hotel Rooms)

## 3. Check the day(s) you will attend the Forums.

- Day 1 - Data Entry - 9 am-2:30 pm
- Day 2 - Data Communications - 9 am-2:30 pm
- Day 3 - Installation Management - 9 am-2:30 pm

NOTE: Afternoon Sessions are open to all - free of charge.

4. Your enclosed check will cover all workshop materials, luncheon, Forum admission and admission to the Exposition Hall (make checks payable to "The Computer Caravan")

- One Day - \$25.00
- Two Days - \$50.00
- Three Days - \$75.00

All Tickets will be held in your name at the door

Exposition only tickets (no forums or luncheon) are \$5.00 and should be purchased at the door (ticket good for all three days).

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For additional registrations, copy this form - or write for extra copies.

# SPACE SAVER

## FOR THE 1973 COMPUTER USERS' FORUM & EXPOSITION - The National Computer Conference that's coming to you.



If you're interested in more efficient EDP operations, then you should be reserving your space right now for The Computer Caravan/73 Users' Forums. This unique program will soon be in a city near you - with shirt-sleeve workshops, panel discussions, user-oriented experts, and an exchange of information that will benefit you and your company.

Each day of the three-day show will feature a different topic. You'll be able to air your problems, and learn how others have solved theirs. You'll ask questions, give opinions - and get answers. And you'll come out of the Forum with some new ideas on making your EDP operation more efficient.

### FORUM TOPICS

#### Day 1 - Data Entry

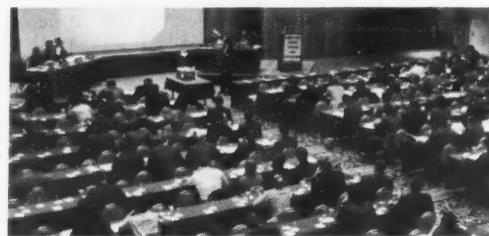
- Including panel discussions and workshops on:
- Keypunch Replacement (shared processor)
- Intelligent Terminals
- OCR
- Direct (on-line) Data Entry

#### Day 2 - Communications

- Four panelists will discuss two top issues:
- Data Transmission
- a) dial-up
- b) leased lines/broadband
- Equipment Selection
- a) communications processors
- b) control equipment (terminals, modems)

#### Day 3 - Installation Management

- Panel discussion on management aspects and workshops on specific techniques in the following areas:
- Personnel, recruiting and training
- Programming management
- Independent Peripherals
- a) memories
- b) other peripherals



#### Forum Attendance is limited

In order for the Forums to work, attendance is strictly limited. So don't wait too long to save your space.

#### OPEN SESSIONS

New for this year, we'll be conducting open sessions each afternoon for anyone who wants to attend. Each day at 2:30 a different subject will be opened up for discussion and controversy. Here's the schedule.

- Day 1 - Data Communications Planning
- Day 2 - Software Evaluation Panel
- Day 3 - Small Systems Panel

#### EXPOSITION

The expanded Exhibit Floor will be open from 10 to 6 each day. A variety of leading companies will be there with their latest EDP products and services. And you'll have plenty of time to look at everything that interests you. It's an excellent opportunity to stay ahead of this fast-moving industry. And if you have to make decisions, you should be there. (Advance registration is not required for the Exposition.)

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# COMMUNICATIONS

## Data Briefs

### Compcon Meeting to Discuss Status of 'Computing Nets'

SAN FRANCISCO — "Computing Networks from Minis through Maxis — Are They for Real?" is one of the questions to be discussed at Compcon '73, the Seventh Annual IEEE Computer Society International Conference.

The three day meeting Feb. 27-March 1 at the Jack Tar Hotel is dedicated entirely to examining networks and will cover such topics as distributed networks, network architecture, network security, research networks, examples in the business community and performance in computer communications systems.

Registration chairman is Ben E. Britt, IBM General Products Division, Dept. H75/Bldg. 141, Monterey & Cottle Roads, San Jose, Calif. 95114.

#### Teleprinter Uses Impact Printhead

BOSTON — Di-An Controls, Inc. has introduced the Series 9030 Teleprinter which uses a matrix impact printhead with operator-selectable speeds of 10-, 15- and 30 char./sec.

The teleprinter offers 132-column print capacity; full ASCII upper- and lower-case codes; adjustable form-feed tractors; half- and full-duplex or local operation; odd, even, or no parity error detection and an RS-232-C interface.

The terminal includes an integral power supply, electronics, keyboard and printer.

The unit costs \$1,955. Di-An is at 944 Dorchester Ave., 02125.

#### Terminal Has OCR Font Option

SKOKIE, Ill. — Teletype Corp. is offering an OCR font option to its Model 37 receive-only terminals.

The terminals are designed to be fully compatible with AP and UPI wire services. Speeds of 100 word/min and 150 word/min, eight-level ASCII and an EIA interface are available.

The price of the Model 37 with OCR is approximately \$3,000. No modification packages will be available for existing model 37s, the company said. Teletype is at 5555 Touhy Ave., 60076.

#### Test Set Analyzes Data Systems

PROVIDENCE, R.I. — The Model 1310 TDM-Modem Test Set from International Data Sciences, Inc. is designed to test and analyze digital data communications systems which include low-speed asynchronous or high-speed synchronous modems.

The Model 1310 generates and analyzes pseudo-random data sequences in the form of start-stop asynchronous characters. Asynchronous bit rates of 75 to 9,600 bit/sec may be selected, or synchronous rates up to 3 mbit/sec.

The Model 1310 costs \$2,150. International Data Sciences, Inc. is at 100 Nashua St., 02904.

### Analysis - Part I

## Value-Added Nets Geared to Data

By Ronald A. Frank

Of the CW Staff

WASHINGTON, D.C. — Another era in data communications services may have begun when Packet Communications Inc. (PCI) filed its application for a "value-added" network with the Federal Communications Commission [CW, Jan. 31].

The services that PCI proposes to bring to computer/communications users are not new. They were pioneered by the Advanced Research Projects Agency (Arpa) network. But the Arpa net has some obvious differences from the commercial operation proposed by PCI.

The Arpa net provides computer resource-sharing services to primarily scientific and research-oriented academic institutions. It is operated by the Department of Defense which reportedly gets wideband facilities from AT&T at a considerable discount over normal private line users.

#### Important Precedents

But the precedents set by Arpa are nonetheless very important. The resource-sharing concept is based on the premise that shared communications facilities operated under computer control mean considerable economies for the subscriber.

These economies come about through more efficient channeling of data over the communications facilities. The data is assembled into "packets" of information, and these packets are switched under CPU control throughout an Arpa, or value-added network.

The user of a commercial packet-switched net will probably enjoy some significant advantages not available to today's private line user. An Arpa or value-added network subscriber does not

have to worry about multiplexers, front-end concentrators, modems, data speeds and all the rest of the complicated engineering involved with the operation of a private line system configured with AT&T lines.

The operator of a commercial Arpa-type network will come right into the user's

Value-added data networks may drastically change the communications services options presently available to teleprocessing users. An FCC application for the first such network has been filed by Packet Communications Inc. This series of articles examines the expected effect of the proposed systems on the user.

installation to supply him with the necessary hardware and software interfacing. The user will retain control over his CPU and data but the value-added carrier will "move" the data on a turnkey basis.

While PCI envisions early FCC approval for its application, others are not so optimistic. At least two other potential value-added network carriers are known to be planning to enter the FCC arena.

Telecommunications Networks Inc. said it plans to file its application "soon," and Telenet Communications Inc. is also studying the prospects of applying for network approval. Telenet is a subsidiary of Bolt Beranek and Newman, which has done most of the Arpa network systems

work for the government.

If the other two contenders apply to the FCC within the next few months, it is possible the commission would consider all three applications in one proceeding. This would probably take at least a year to complete. Another important question is the status of these new carriers with regard to regulation.

The PCI application acknowledges that the company "is offering a unique type of service which does not easily fit within traditional [FCC] classifications." But PCI said it is willing to be classified as a common carrier and its application proposes a tariff complete with rates and types of services.

From the user's standpoint, the major difference under existing AT&T tariffs would be the profit that PCI could make from its services. A common carrier is allowed a specified rate of return approved by the commission, but if PCI were simply classified as a special customer of AT&T, under the sharing provisions of its Tariff 260, then PCI would not be allowed to make a profit from the resale or sharing of its lines to the customer.

Some industry experts believe AT&T has given "informal notice" to the value-added companies and the FCC that it intends to amend its Tariff 260 to cover the new applicants. But no one is sure how the commission will interpret the role of the value-added networks.

## Western Union Would Liberalize Telex, TWX With Rate Increases

NEW YORK — Western Union Telegraph Co. has applied to the FCC for permission to offer a liberalized interconnection service for TWX and Telex users.

A basic change in the proposed services would separate the line, or "access charge," from the terminal cost, thereby making it easier for users to connect independent terminals.

#### Separate Installation Cost

While WU is simplifying the use of customer-provided equipment, it is also proposing to set a separate installation charge for both the line and the terminal. This means that the subscriber will pay \$100 for a new installation compared with the present \$50 charge. If a user switched from a WU terminal to independent device, he would have to pay \$50 for a "new installation," according to a WU spokesman.

The access charge for a TWX line would be \$11.50/mo while the access charge for a Telex line would be \$24/mo. If WU provides the terminal, the charge would be \$49.50/mo for a Model 32 ASR on the Telex service and \$62/mo for a Model 33

ASR on the TWX net.

An increase in the cost of computer interfaces for both services is also proposed. A data set arrangement on TWX would be increased from \$30/mo to \$40/mo. The increase would be \$8.50/mo for the first line connected to a CPU and \$10.25/mo for each additional line, a spokesman said. On Telex the cost would increase \$8.50/mo for the first line connected to a CPU with no increase for additional lines.

The proposed rates will take effect Feb. 28 unless suspended by the commission.

#### Data 100 Terminal Dressed Up

MINNEAPOLIS — Data 100 Corp. has announced two enhancements to its Model 70 Remote Batch Terminal — designed as an IBM 2780 replacement unit.

New features include a line printer, rated at 1,250 line/min, and a higher communications speed of 19,200 bit/sec, the firm's spokesman said.

The firm is at 7725 Washington Ave., 55345.

## Now...get both in one... a batch terminal and a time sharing terminal.

No longer is it necessary for the batch terminal user who has a need to access a local time sharing system to maintain a simple, low-speed terminal just for this purpose in the same office. Sycor now has eliminated this expense by adding low speed (100-300 baud) asynchronous communications capability to its Model 340.

A Sycor 340 user can access any major time sharing system, input the problem, receive the solution, and continue with the data entry operation. Captured data then can be batched to the central computer facility at

1200-4800 baud speeds using IBM-compatible BSC procedures.

In addition to this unique dual communications capability, Sycor provides users with T.A.L., a programming language developed specially for data entry applications. A wide choice of peripherals also is available—printers ranging in speed from 30 cps to 200 lpm, 7 or 9 track magnetic tape drives, and a 250 cpm card reader.

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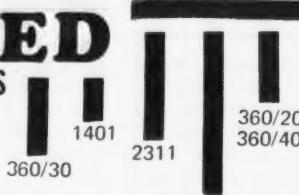
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**Ties to 360/370s**

# CDC Cyber 1000 Switches Nets

MINNEAPOLIS — Control Data Corp. has upgraded its M1000 data communications system to the expanded Cyber 1000 system. The new system includes faster memory speeds, higher transmission rates and increased disk capacity.

Designed for large users such as multiplant manufacturing firms, the Cyber 1000 operates as a store-and-forward message-switching center or as a data preprocessor to handle communications control.

**Interfaces Most CPUs**

The Cyber 1000 system can be interfaced with 360/370 mainframes in the Model 40 and Model 135 and larger categories. In addition to IBM systems, the CDC system can be interfaced with most major mainframes, a spokesman said.

The Cyber 1000 has a 900-nsec memory compared with the 2.4 sec on the M1000 system. Communications speeds up to 9,600 bit/sec can be supported with 50 kbit/sec capability available if required by the user.

For existing M1000 users the new system is

completely "software-compatible" and the processor or line controller can be replaced without changing the peripheral equipment, the spokesman said.

Each Cyber 1000 processor can support up to 128 lines using teletypewriters, CDC 711 and 713 CRTs and IBM terminals including the 2740, 1050, 2780 and virtually all binary synchronous terminals, CDC said.

**Disk System Upgraded**

The disk storage system has been upgraded to 24M "bits of fixed-head storage" compared to the maximum 12M bits available with the M1000. An IBM 3330 disk system could also be interfaced to the Cyber 1000, the company said.

A single-processor Cyber 1000 system with disk and tape system controlling about 20 lines would cost about \$250,000. Monthly rentals range from \$100 to \$170 per communications line depending on configuration. Deliveries range from six to 18 months and include full systems support, CDC said.

Up to eight disk and tape systems can be attached to a Cyber 1000 processor, in addition to card punch and reading units. The system can also support multiple hosts which are not compatible with each other but can be interfaced through the Cyber system. Dual Cyber processors can be configured to provide redundancy.

## **CMC Adds Telebatch To Key Entry Units**

SANTA MONICA, Calif. — Computer Machinery Corp. has added a communications capability to its Keyprocessing key-to-disk system.

The Telebatch feature allows CMC systems to transmit data at speeds from 1,800 bit/sec to 19,200 bit/sec between data entry units and 360/370 or "similar" CPUs. Telebatch adds the capabilities of IBM 2780 terminals to CMC systems including batch data entry, job entry, output printing and media conversion, the company said.

Using binary synchronous communications protocol, the Telebatch feature operates with the user's modem and handles EBCDIC code transmission. The Telebatch capability can be added to 5, 7, 9 and 18-station CMC systems and can operate with IBM 2780 or equivalent terminals.

The Telebatch controller and operating system cost \$3,300 or \$95/mo with maintenance. Enhancements such as remote job entry cost \$1,200 or \$30/mo. First deliveries are scheduled for the third quarter of 1973. CMC is at 100 Wilshire Blvd., 90401.

## **NCR Banking Terminal Uses Dual Memories Off-Line**

DAYTON, Ohio — NCR has introduced an electronic teller terminal for commercial banks.

The 275-100 programmable terminal can handle bank transactions not requiring a passbook. The terminal includes two internal memories — one a 2K core memory for "application program loading" and the other a 4K MOS/LSI memory to control the terminal.

A program is loaded into the 275-100 through punched paper tape or a magnetic tape cassette. The basic program allows the terminal to operate off-line, but the unit can be converted to operate on-line to a CPU, the company said.

Each terminal can be shared by two tellers. Entries are made through a 10-key keyboard and editing is done with an 8-digit display. All transactions are recorded on a "fully protected lock-in journal tape."

A separate printer is used for validation and receipt printing with a second printer handling customer receipts or other listings. The terminals cost \$4,495 or \$145/mo with first deliveries late in 1973.

# SYSTEMS & PERIPHERALS

## Bits & Pieces

### Magnetic Tape System Offered to Mini Users

PALO ALTO, Calif. — Precision Instrument Co. (PI) has come up with an 800/1,600 bit/in. mag tape system for minicomputer users.

The system includes a PI-1400 digital magnetic tape recorder, computer interface, formatting electronics and a complete software package, according to a firm spokesman.

Dual-density 800/1,600 bit/in. read/write electronics are standard. The 7-channel recorder has 200, 556 or 800 char./in. (choice of two). The 9-channel recorder interfaces in either 800 char./in. NRZI or 1,600 char./in., phase-encoded mode, the spokesman said. Standard tape speeds are 12.5, 25, 37.5 and 45 in./sec., he added.

System price is under \$8,000 from 3170 Porter Drive, 94304.

### PDP-11 Users Get Cassette OS

SAN JOSE, Calif. — Dicom Industries has a cassette operating system with a complete hardware/software/interface package for Digital Equipment Corp. PDP-11 series computers.

Complete as a unit or an integrated additional I/O device within the user's own system, the software of the CMTOS-PDP-11 Model 344 includes a system loader, command processor, driver, modified IOX, debugger, editor and assembler.

Cost, according to a spokesman, is \$3,450 for the unit, \$850 for the interface and \$895 for the software.

The firm is at 715 N. Pastoria Ave., 94086.

### Positioner for Electronic Control

OCEANSIDE, Calif. — A new 2-axis positioning system, the NPT-2000, designed to bring electronic control to a wide range of industrial applications, is available from Hughes Aircraft Co.'s industrial products division.

Two system versions are offered, priced at \$14,500 and \$15,750 from 2020 Oceanside Blvd.

### DC Power Sources Available

IRVINE, Calif. — Users with high-speed automatic testing, process control or similar applications requiring an accurate and stable DC power source can use two computer-controlled DC power sources from Moxon Inc.

Models 3536 and 3537 are designed for direct interface and operation with computers, data generators, TTL binary inputs, automatic controllers or similar sources.

The price is \$1,495 from 2222 Michelson Drive, 92664.

### Can Replace Sigma 3

## Xerox Has Foreground/Background Mini

By Michael Weinstein  
Of the CW Staff

EL SEGUNDO, Calif. — Xerox Corp. has unveiled a minicomputer system with foreground/background capabilities which could compete with the PDP-11/40 in many applications.

The 530 will be offered as a replacement for the Sigma 3 — in some configurations, at about half the cost — and to users with applications such as process control, monitoring, testing and checkout and communications message-switching, a spokesman for the firm said.

Using the example of communications control, the spokesman explained, the real-time task of message-switching would be handled in the foreground with the user able to perform standard batch operations in the background on an interrupt basis.

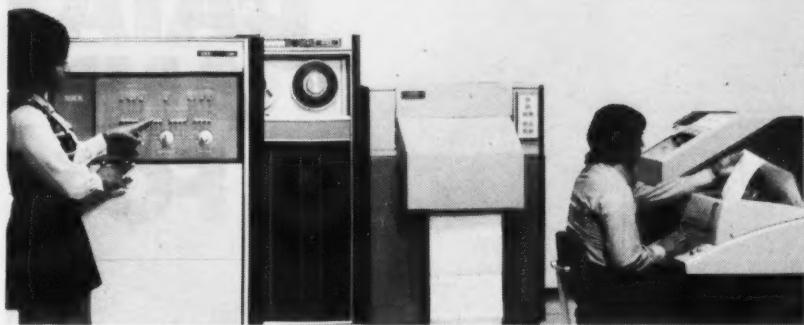
The 530 is a 16-bit computer equipped with an 8K-word memory that is field expandable to 65K words in 8K increments, the spokesman said.

### Multiple Buses

It employs a multi-bus architecture with three access paths to memory for connecting various processors and system devices. Conflicts that might arise from simultaneous requests are resolved by a hardwired priority scheme, the spokesman added.

Memory cycle time for a 16-bit word is 800 nsec with memory access time at 480 nsec.

Either one or two I/O processors can be used with the 530 with the channels operating asynchronously — with each other and the processor — to provide data transfer/communications between peripherals and memory.



Xerox 530 technology includes LSI and MSI components.

I/O processor #1 — standard — can handle 16 channels with I/O processor #2 capable of handling an additional 12 channels, the spokesman said.

### Compatible Peripherals

Various standard and special-purpose peripherals for the 530 are available allowing the user to specify system configuration from his application needs, the spokesman asserted.

A cartridge disk storage subsystem available with the 530 has capacities from 2.3M to 18.4M byte/controller and a transfer rate of 312 kbyte/sec — average access time is 50.5 usec.

The disk storage subsystem has capacities from 24.5M to 196M bytes, a transfer rate of 312 kbyte/sec and an average access time of 87.5 usec.

Fixed-head rapid-access data files have a capacity of 3M bytes per unit; transfer rates are 188 kbyte/sec and access time is 17 usec.

Both 7- and 9-track mag tape drives are available — either 37.5 or 75 in./sec —

with transfer rates of 20.8- and 60 kbyte/sec, respectively.

Purchase price for this configuration is \$62,900.

Deliveries of the 530 are expected for the third quarter of 1973 with a dual-processor capability and optional bipolar memory to be offered at a later date.

Card equipment offers reading speeds of 200 and 400 card/min with the ability to read intermixed binary or EBCDIC codes.

Line printers with speeds from 350 to 1,100 line/min have 132 print positions and up to 64 characters.

Software includes a choice of two operating systems, both of which allow multiple real-time jobs to be run in the foreground while general-purpose batch programs are concurrently run in the background, the spokesman said.

Languages include three Fortran compilers — including ANSI Fortran IV — and a report program generator (RPG) for implementing business applications, he added.

A typical configuration with a 16K-word processor, 2.3M-byte cartridge disk storage subsystem, buffered 350 line/min impact printer, 200 card/min reader and 10 char./sec keyboard console leases for about \$1,700/mo.

## MDS Adds Multi-Job Processor

UTICA, N.Y. — Mohawk Data Sciences (MDS) has upgraded its key-to-disk system with an increase in disk storage capacity and a communications capability for the system's shared processor to allow users to operate in a multi-job environment, according to a spokesman for the firm.

The 2409-I data entry system allows users to access 350K bytes of usable disk storage area — more than double that for the previously offered 2404.

Also available to the 2409-I is an optional concurrent communications/keying capability which enables the user to input key-to-disk information at the same time the system is communicating to or from a larger processor or terminal, the spokesman said.

Used in this multi-job manner — key entry operations concurrent with communications operations — the system is capable of functional emulation of RJE communications terminals such as the

IBM 2780 and 2968, and the 360/20 Hasp work station, at speeds ranging from 1,200- through 9,600 bit/sec.

Concurrent tape-to-printer/keying capability is also an option on a choice of three printers — at speeds to 760 line/min, the spokesman asserted.

In addition, users have a choice of nine magnetic tape drives with densities ranging from 200 through 1,600 bit/in.; both 7- and 9-track units are offered, he added.

The basic system consists of eight keyboards, a 32K-byte shared processor and a tape drive which can be expanded to 24 keystations, or a 64K-byte shared processor and two tape drives, the spokesman said.

Rental for the shared processor and disk subsystem is \$840/mo. Mag tape drives range from \$200 to \$275/mo. Cost per keyboard is \$175 for eight stations and around \$100 for a maximum of 24.

First deliveries will begin in June from Box 362, 13505.

## Switch Moves Add-Ons Off-Line to Meet IBM Requirements

NEWTOWN, Pa. — A new switch arrangement from Computer Hardware Consultants and Services, Inc., for its Model 3768 core memory, permits IBM maintenance of upgraded IBM 360/30 systems under standard agreements. The off-line switch, approved by IBM, electronically negates alterations of Model 30s that expand core memory beyond IBM limits and up to 256K.

The IBM customer engineer then can run standard diagnostic maintenance checks on the 360/30. The switch costs \$155/mo and can be delivered in three weeks from the firm at 8 Pheasant Run, 18940.

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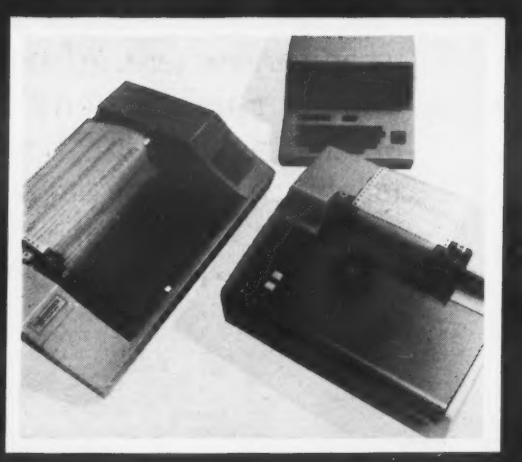
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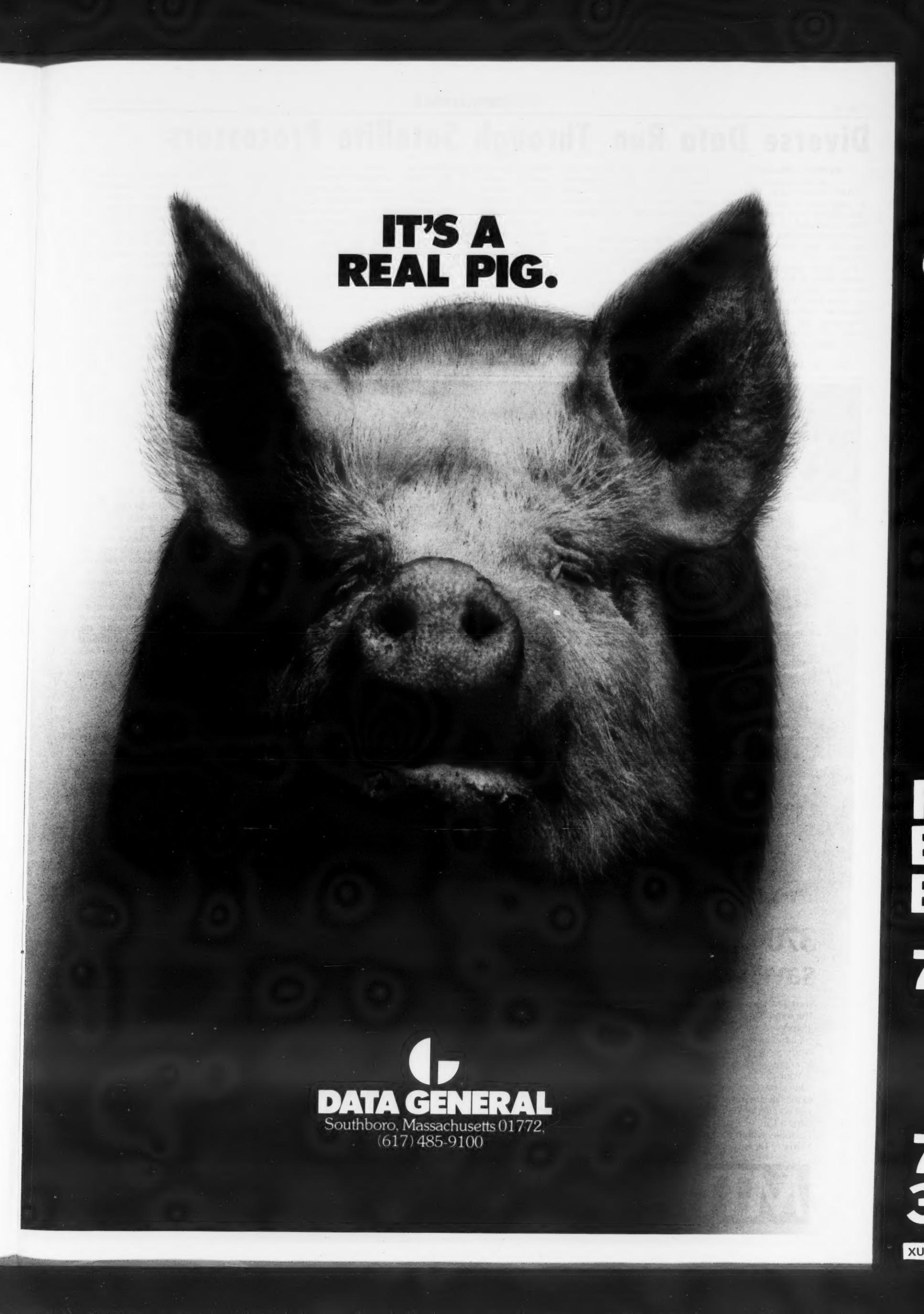
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# Diverse Data Run Through Satellite Processors

By Michael Weinstein  
Of the CW Staff

**EAST HARTFORD, Conn.** — A large user is networking an IBM 360/65 to 11 Singer System Tens connected to over 600 remote programmable terminals to perform data entry operations off-line.

The use of satellite processors allows Pratt & Whitney Aircraft to enter large, diverse amounts of data into the network in a real-time environment without degrading the system performance of the larger IBM system with large I/O-bound applications.

Types of data entered from

terminals and stored on the Singer Tens' disk subsystems are: completion of production tasks; location of parts; checks of machine usage; and employee attendance.

## Workers Involved

In the case of employee attendance, as each employee enters or leaves the plant he depresses a specified key on one of the terminals.

Hitting the key invokes the employee attendance program and the employee is directed by a display to enter his badge into a reading device.

When the employee enters his

badge, time and location information is added by the "intelligent" terminal and the entire field is transmitted to a Singer Ten processor.

As more employees enter the plant a disk file is formed of employee time of arrival. This disk file — and other identical files created at other Singer Tens in other plant locations — is polled by the 360/65 to create a composite file of employee attendance.

At night this information is processed in a batch environment to produce reports available to company officials at 7 a.m. the next morning.

Since each satellite processor is a complete system in itself, more complex operations are possible. For example, using the employee attendance application, if a badge is stolen, programs can be written for the Singer Tens to scan all badges as they are entered to find the invalid number.

If this number is encountered, a bell will alert local security guards and a message will be displayed at the operator's console.

Each 100K-byte Singer processor is segmented into 20 partitions and a common area for program and operating system

utilization.

The first 5K-byte partition is dedicated to the programmer-operator. This area would perform the scanning operation to search for the invalid badge.

The other 19 segments are divided into 3K bytes each to accept information transmitted from the terminals.

Each of these partitions operates on a "slice-of-time" operation — i.e., the computer polls each in turn to see whether a terminal wishes to transmit data.

If a terminal is in a send mode, the data is transmitted into that partition for formatting and storage on the satellite's disk subsystem.

The common area accesses about 38K bytes to handle the formatting and operating system for the satellite processor.

Also resident in the common portion of core are the application programs for the remote terminals.

## Two Terminal Types

Terminals fall into two types: an attendance station and a job information station. The difference is that attendance stations are simpler and are used only for employee attendance reporting and the job information terminals can be used for multiple applications.

Within the job information terminals, up to 10 applications can be stored internally with the ability to call for additional programs from the Singer Ten's disk subsystem.

Also included is logic to add information as to time and location of all data entries.

Job information terminals accept messages entered by badge, punched card and through the unit's keyboard.

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## Police Center Run on \$25,000 Budget

HARTFORD, Conn. — On a \$25,000/yr budget the police department of this city has set up a computer system to help manage a variety of police activities.

The goals of the disk-oriented NCR 50 system are to develop a management information system (MIS) and a criminal identification system (CIS) to be tied into the state and national networks.

In the MIS application over 121,000 calls for assistance are presently stored on disk. These calls can involve anything from dog bites to car accidents to homicides, Robert Dunphy, DP manager, said.

Also included in this file are the location of the incident, the car and officers who attended, time taken to handle the situation and resultant action.

### Spotlighting Crime

From this data base, reports are prepared showing when and where certain types of calls occur. The police department can then determine high crime areas and provide more patrols in these areas, Dunphy stated.

The system also performs time accounting functions such as computing sick leave, vacation time, compensatory duty, etc., he added.

In the future, the department plans to use the system to prepare FBI Uniform Crime Reports and survey requests from special interest groups.

For example, Dunphy noted, data about sites of accidents can be correlated with present traffic enforcement practices to improve traffic safety.

### Criminal Activities

The criminal identification system will store information on previously arrested criminals including physical characteristics, past history, method of operation and identification numbers such as Social Security, armed forces serial numbers, etc.

This information will be used to assist investigators in searching for suspects for particular types of crimes, Dunphy noted.

The NCR 50 is equipped with 4M-byte removable disks. Dunphy plans to keep information on-line seasonally and store past information in a tape library.

The department also has a remote-access terminal linked to the state's DP center to get motor vehicle information, Dunphy said. Similar terminals linking local police to the regional networks and the National Crime Information Center in Washington, D.C. are planned.

## Fastrack 3 Series Fixed-Head Disks Replace IBM 2305s

SAN DIEGO — The Fastrack 3 fixed-head disk memories from Pacific Micronetics are intended as direct replacements for IBM 2305 fixed-head disks. They are designed for applications requiring fast access time and short swap time, such as virtual memory, real time, time critical or time sharing applications, the company said.

The memories are available in two series. The old series consists of two models — 3,600 and 6,000 rpm — both with 128 tracks capable of storing 120K bit/track.

The 010 units have a total capacity of 1.8M bytes, a spokesman stated.

The 100 series is available in six models, all with 120 Kbit/track, 3,600 or 6,000 rpm, with capacities of 2.8M, 5.7M and 11M bytes on 192, 384 and 768 heads respectively, the spokesman said.

Data transfer rates are 7.2 MHz for the 3,600 rpm models and 12.0 MHz for the 6,000 rpm units, he added.

Head loading is provided by a pneumatic diaphragm in the 010 series and a low-duty cycle compressor in the 100 series.

Heads are held in a retracted position, the spokesman said, until predetermined speed is reached, then loaded under an rpm-dependent loading program.

Fail-safe head retraction is provided in case of abnormal rpm, pressure or power conditions, he asserted.

Prices range from \$8,600 to \$10,800 for the 010 series and \$19,300 to \$59,940 for the 100 series. Itel will market the devices to end users.

## Disk System for PDP-11 Expandable to 10M Words

SCOTTSDALE, Ariz. — The Data Miser Model 110, from International Memory Systems, provides PDP-11 users with a plug-compatible moving-head disk memory system with 1.25M words of storage.

The system can be field-expanded with up to seven additional disks for maximum storage capacity of 10M words.

Included in the \$4,950 unit are software, controller, disk, power supplies and cabling needed to tie the system into the PDP-11 Unibus, the firm's spokesman said.

Each additional 1.25M-word disk drive costs \$1,950.

The system is DEC DOS-compatible or an IBM DOS monitor recorded on disk is available, he added.

Transfer rate is 10  $\mu$ sec/word with an average random access time of 75  $\mu$ sec.

Delivery is 60 days from 14609 N. Scottsdale Road, 85254.

## Computers and the DP Employee--Part III

# Disillusioned UK Managers Shun Ambitious Plans

By Joseph Hanlon  
Special to Computerworld  
(end of series)

LONDON—Disillusionment resulting from unfilled computer promises is causing managers to shun ambitious projects. Interest is decreasing in management information systems and other ambitious projects, as well as in software packages.

The culprit is "heavy software costs" and "overoptimism in the ability of analysts and programmers to translate human activities into computer programs," according to the report on "Computers in Offices" issued by the UK Department of Employment (DE).

As a result, there has been a "reduction in the plans of potential computer users," the report declared. Some of the cutbacks are temporary, due to the recession or to "disillusionment following the early overoptimism, which caused potential users to overreact." Nevertheless, the report concluded, "the long-term trend in the growth of computers is likely to drop."

The work to which computers have been applied is still mainly of a repetitive nature. Some of the more ambitious systems for improving decision-making by management, involving the coordination of data from all aspects of business (integrated data bases), have not yet generally made the progress once expected."

### Bright Spots

Two changes are occurring, however, which are not reflected merely by counting machines: computers are being used more intensively, and there is some tendency to upgrade to a bigger machine rather than buy an additional computer.

Both of these changes reflect the one bright spot for computer users in the report: computers are doing increasing amounts of the traditional routine clerical jobs, and the efforts of the past few years are just now beginning to pay off. Indeed, as was noted in the first part of this series, computers are taking away clerical jobs at an ever increasing rate.

In particular, computers are doing a broader range of tasks. The DE lists seven types of work: stock control, invoicing and billing, financial accounting, general statistics, management information, payroll and production control. In the 1964 survey, the average installation was doing work in only 2.8 of these categories; by 1969 it was working in 4.6 categories.

On the basis of computer time spent, invoicing and billing had risen from 13% to 18%, while payroll had dropped from 21% to 11% and stock control fell from 16% to 10%. Significantly, management information time dropped from 18% to

14% despite the fact that more installations were doing this sort of work.

Despite the curtailment in advanced applications and the slowdown in expansion, 95% of users are either "satisfied" or "very satisfied" with EDP.

The report concluded that computers are "a reliable asset in increasing the efficiency of offices and so aiding substantially the efficient and profitable control of business."

### Packages Hit

In the area of criticism, software packages received a strong attack. At the time of the survey, 50% of the installations were using packaged software, "though usually to a limited extent." But the report noted that often "the benefits the programs offered—in quicker introduction of computer processing and savings in systems analysis and programming time—were more than offset by the cost

and time needed in practice to alter the package to suit the needs of the individual user."

The use of packages will not increase significantly, the report warned, "unless packages can be made far more flexible and economical, or unless management undertake a great change in the policy toward standardization."

Even in-house software proved to require far more time and manpower than expected, and "many installations never did reach a settled state of routine running, with only maintenance and minor modifications of programs to take care of."

The report cited four reasons:

- "Office procedures changed more frequently than was at first thought."
- "Even small changes could demand large time-consuming alterations to computer programs."
- "Often the original project took far

longer to achieve than planned.

- "A lot of projects were altered or added to during their implementation."

In part because of the new disillusionment, the explosive growth in the use of computers is over, according to the report. The increase in the number of office computers in the UK has been a steady 500 a year since 1967, and the DE predicted little change in this until the mid-1970s, when the number is expected to drop. The number of office computers will increase by only 340 in 1978.

This prediction should be taken seriously because the DE's past predictions have been very accurate. In 1965, when there were only 605 office computers in the UK, the DE made a similar projection. It was widely criticized for being too low. But in 1969, the last year a complete census is available, there were 2,108 office computers compared to a predicted 2,080.

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In our February 28th Software Supplement, Computerworld will be taking a hard look at a variety of software sources currently available to EDP users. Payroll packages. Inventory. Accounts receivable. And others. We'll look at their efficiency, costs, ease of installation, and problems. We'll discuss when they might be better than doing-it-yourself, and when they're not.

Edited by Computerworld's software specialist, Don Leavitt, our February 28th supplement will also examine some of the companies that produce and sell software packages, custom programming services, programming aids and remote-computing application services—with an eye to what they do, who works for them, and what areas they serve.

If you use software from outside sources—or are thinking about it—this supplement is must reading. And if you're selling in the software market place, your ad should be there on February 28th. Supplement closing is February 9th. Your Computerworld representative can give you all the details. Or call Judy Milford at (617) 332-5606.

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**On February 28th,  
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takes a hard  
look at Software.**

# 'NSF DP Conference' Highlights Research

COLUMBUS, Ohio — The Computer Science Conference here Feb. 20-22, sponsored jointly by the National Science Foundation and 16 universities and industrial organizations, will be primarily devoted to short, current research reports, according to conference organizers.

The meeting format differs from the usual computer science conference in several ways, according to organizers.

## Calendar

Feb. 22, Washington, D.C. — Seminars on "Profit Planning and Control Systems" and "MIS Design Strategy," and on Feb. 23 "Cost/Benefit Analysis of MIS" and "Ingredients of Successful MIS Project Management." Contact: The Society for Management Information Systems, 18 South Michigan Ave., Chicago, Ill. 60603.

Feb. 26-28, Palo Alto, Calif. — First Annual SicMe Symposium sponsored by the Special Interest Committee on Measurement and Evaluation. Contact: Conference Publicity Chairman, Jan C. Matser, Informatics Inc., 3971 E. Bayshore, Palo Alto, Calif. 94303.

Feb. 27-March 1, San Francisco, Calif. — Seventh Annual IEEE Computer Society International Conference (Compcon). Contact: Registration Chairman, Ben E. Britt, IBM General Products Division, Dept. H75/Bldg. 141, Monterey & Cottle Roads, San Jose, Calif. 95114.

It is being held in the winter, to fit into academic schedules, and it is designed to provide a forum for current research in all areas of the computer and information sciences.

The emphasis is on contributed papers, and there will be an employment register and an interviewing facility available.

The four invited papers include extensible languages, by Bernard Galler, University of Michigan and the parsing of deterministic languages, by Michael A. Harrison, University of California.

Joseph Traub of Carnegie-

Mellon will speak on recent progress in algebraic and analytic computational complexity, and Allen Newell, also of Carnegie-

education, music and programming languages.

A luncheon for computer science department chairmen will be held Thursday.

Fees for the conference are \$10 for non-students and \$3 for students. Chairman is Dr. Marshall Yovitz, Ohio State University, 101 Caldwell Laboratory, 2024 Neil Ave., 43210.

A meeting of the Association for Computing Machinery Special Interest Group on Computer Science Education, starting on the last day of the program, lets attendees attend both conferences.

## Afips Adds Two

MONTVALE, N.J. — The board of directors of the American Federation of Information Processing Societies has elected to member status the Instrument Society of America (ISA) and the Society for Industrial and Applied Mathematics (Siam).

The additions bring the total membership in the federation to 13.

"The change in membership status for ISA and Siam recognizes the important contributions being made to the information processing field by members of the two societies," said Afips President Walter Angerson.

## Societies

Mellon, will discuss Merlin and the problem of understanding.

Topics covered in about 370 papers in 41 sessions include user-computer interaction/computer centers, graphics, logic design, artificial intelligence, computer architecture, and applications, such as medicine, ed-



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## Symposium to Offer Computer Science Smorgasbord

COLUMBUS, Ohio — The Third Technical Symposium of the ACM Special Interest Group on Computer Science Education (Sigcse) has a little of "almost everything," according to conference coordinator Gerald Engel.

The two-day symposium Feb. 22-23 is being held in conjunction with the Computer Science Conference.

Session topics range from looking at computer science as an entity within the university to its role as a service course to other departments, to the relation of computer science to en-

gineering.

More than twice as many papers have been received as ever before for a Sigcse symposium, Engel said. Papers come not only from the university community, but also from industry and the National Bureau of Standards, he added.

Anthony Ralston, president of the Association for Computing Machinery, and Aaron Finerman, Sigcse president, will deliver the welcoming address Thursday morning.

Sigcse is associating with the Committee on Computers and Engineering Education of the

American Society for Engineering Education (Asee), and an opening paper by Harold Bolz, dean of the school of engineering at Ohio State, reflects this liaison in its title, "Computers and Engineering Education."

The other opening paper, by Robert Ashenurst of the University of Chicago, will examine the implications for computer science departments of the ACM Information Systems Curriculum.

Titles of parallel sessions include: service aspects of the first course; pedagogy; two-year programs in computer science; train-

ing of secondary school teachers; discrete structures courses; studies on curriculum; and programs in information processing.

Aspects of curriculum '68 will be treated not only in the opening paper, but in the studies on curriculum session with a report on a study last summer on "A Community/Junior College View of Curriculum '68."

The session on curriculum implementation will also include a paper on computer science education through a rearview mirror: experience with curriculum '68, presented by George W. Gorsline of Virginia Polytechnic

Institute and Duff Green III of Virginia State University.

Thursday evening is devoted to special interest sessions, such as in what department should computer science courses be offered?

There is no preregistration. The fee for the conference is \$15 for Sigcse members, \$25 for ACM or Asee members, \$30 for non-members and \$5 for students.

More information is available from Gerald Engel, Department of Computer Science, Penn State University, University Park, Pa.

### Auditors Form National Group

Special to Computerworld

LOS ANGELES — The EDP Auditors Association has adopted a new set of bylaws to permit it to operate as a national organization, with the initial charter chapter located here.

Specifically, the objectives of the association are:

- To promote the education of, and help expand the knowledge and skills of its members in the interrelated fields of auditing and EDP.
- To encourage a free exchange of EDP audit techniques, approaches and problem-solving by its members.
- To communicate to management and to systems and EDP professionals the importance of establishing controls necessary to ensure the effective organization and utilization of DP resources.

Questions relating to membership or the formation of chapters should be addressed to EDP/AA, P.O. Box 15562, 90015.

### ACM's Reviews Expands Coverage

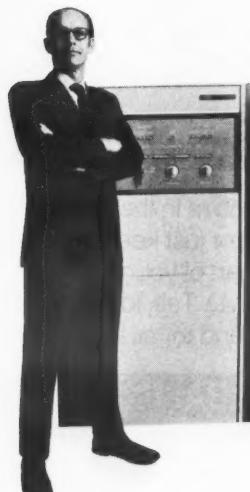
NEW YORK — In an effort to cut duplication between societies in the computer industry, the publication committees of the Association for Computing Machinery and the IEEE have announced that *Computing Reviews* will be expanded to provide more material of interest to IEEE members, particularly members of the IEEE Computer Society.

The IEEE has dropped its computer publication, and members may subscribe to *Computing Reviews* for \$15, rather than the \$25 non-ACM member price.

The publication is expanding its coverage of hardware, software and telecommunications.

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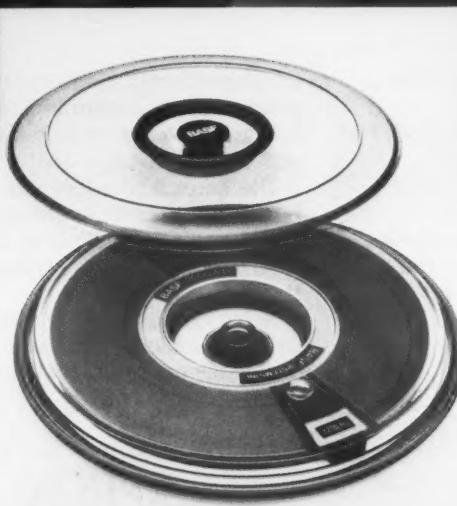
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# COMPUTER INDUSTRY

## CI Notes

### IBM Sues Telex-Again

TULSA, Okla. — IBM has filed a suit against Telex in the Federal District Court here charging breach of a 1966 patent agreement and is asking for payment to IBM of royalties due under the agreement.

IBM charged that Telex has failed to pay royalties, estimated at \$750,000 for the use of patents in magnetic tape and disk equipment.

Telex President S.J. Jatras said the suit "is calculated to divert Telex's financial and manpower resources and to detract from the main antitrust issues raised by Telex's pending antitrust suit against IBM."

### Guzy Resigns From Memorex

SANTA CLARA, Calif. — Two top executives at Memorex Corp. have resigned, and President Laurence L. Spitters has "resumed direct operational control," according to a company spokesman.

D. James Guzy, executive vice-president, regarded by some as the firm's chief operating officer, and Alan F. Shugart, vice-president, development, were the latest in a series of executives to resign from the firm.

A spokesman said Memorex is "curbing to a certain extent our development expenses. We cut all expenditures."

### Amtote Wins OTB Race

NEW YORK — American Totalisator Co., Inc. (Amtote), a relative latecomer to the race for the single vendor contract from the Off Track Betting Corp., nosed out the two other contenders.

With the announcement last week, all Computer Sciences Corp. terminals were converted to the Amtote system, and Ticketron's terminals will be converted by the end of March.

The selection of a single vendor is expected to reduce OTB's monthly costs by \$250,000, according to OTB President Howard Samuels.

### Supershorts

Interdata, Inc. has set up a new corporate function, the Planning and Advanced Development Group, which will function as the "avant-garde" for Interdata's long-range planning.

Magnetic Head Corp. has been awarded patents covering new methods of constructing IBM-compatible magnetic tape transport heads.

System Development Corp. received a multimillion dollar Air Force contract to develop, install and test the Space Computational Center System Segment of the North American Air Defense Command's Cheyenne Mountain Complex Improvement Program.

### 'To Curtail IBM Marketing'

## CIA Gives Justice Early Relief Plan

By E. Drake Lundell Jr.

Of the CW Staff

LOS ANGELES — The Computer Industry Association (CIA) has submitted to the Justice Department an eight-point plan designed to "retain competition within the data processing industry and to curtail controversial IBM marketing practices pending the outcome of the U.S. antitrust suit against IBM."

The plan calls for releasing IBM customers from all penalty clauses in contracts, publicizing IBM sales statistics and enjoining IBM from such practices as "tie selling," predatory pricing, refusal to deal and making premature product announcements.

The result of a meeting of 52 industry firms, the plan "reflects input from companies with the total of 100,000 employees and 1972 sales of \$3 billion," according to Dan McGurk, CIA president.

"This plan for early relief for the industry — both manufacturers and users — is of particular importance now that IBM has obtained destruction of the master index to internal documents subpoenaed by the U.S. Government," McGurk said.

"Without that index, we expect the government will require even longer to prepare its case than before," he added.

"This plan is for early relief and does not in any way address the larger and longer-term relief, which must undoubtedly have structural elements," McGurk added. "Nor does it attempt to solve the problem of interim relief, recognized by the government this fall in a request to the court.

"Interim relief will not be granted by any judge in all likelihood until at least some of the charges in the government's complaint against IBM are proven in court," he added.

The proposals are directed primarily toward improving information in the marketplace and guarding against questionable or clearly illegal tactics, CIA said. Some details of the plan are consistent with orders that were contained in the 1956 Consent Decree and in prior IBM statements concerning its intended pricing policies, McGurk noted. The following relief measures are contained in the plan:

- "IBM must release customers from any cancellation penalties for lease cancellation with 30 days' notice. Any future leases written for more than a year's period will be cancellable at the customer's option on not more than 90-day notice, after the first year, without penalty."

- "IBM must make the following information public: complete specification of the interface between all IBM products, both software and hardware. These specifications must be made available at the time of announcement or first delivery of any product (whichever comes first) and should be updated if they are changed to engineering change orders."

- "IBM is enjoined from tie selling. Each functional unit of hardware, software and service must be separately priced. Functional units include CPU, memory, channels, features, devices, system control program, data management system, maintenance programming, compilers, application program and man hours of senior systems analyst."

- "IBM must make the following information public: the number of units of each product, by discrete product type, in use by country, as of each Jan. 1 from 1969 through 1973."

In addition, quarterly reports must be filed for each separately priced product, to show shipments to and returns from rental or purchase customers including country of installation.

- "IBM is enjoined from predatory pricing. IBM should be enjoined from pricing a low-profit or non-profit level with the intent or effect of eliminating competition and enjoined from discriminatory pricing."

"Pricing of all products should reflect

reasonable cost relationships, and prices among customers should not be discriminatory."

"To insure this, IBM should submit (to the Justice Department or to an outside audit firm) its pricing rationale on every product offered, to include manufacturing costs, amortization of development, expected volume and expected production life."

- "IBM must make the following information public: complete specification on new or changed media. Since IBM establishes the *de facto* standards on media, their specification must be published upon announcement of a new medium."

- "IBM is enjoined from refusal to deal. IBM must sell or rent any product or service offered to anybody, to everybody desiring to purchase or rent the product or service."

This includes selling spare parts to non-maintenance companies as well as maintenance companies, selling physical standards (such as calibration magnetic tape

(Continued on Page 26)

### Begins in May

## France Prepares for 'Caravane'

PARIS — The Caravane Informatique, the first of three European Computer Caravans, will open in Paris the first week in May and will visit Bordeaux, Marseille, Lyon, Strasbourg and Brussels.

Patterned after the U.S. caravans, the traveling user's forum and exposition is sponsored by Computerworld and the French publisher, *Zero Un Informatique*.

It is particularly appropriate that France is the first country to have a Computer Caravan in Europe because all the previous expositions have been centered around Paris while major areas of growth and the installation of new computers in recent years have been outside of Paris, noted Gilbert Christini, editor and chief of *Zero Un Informatique* and forum director. The Caravane Informatique will allow the users in key regional areas to meet and exchange ideas and view the

latest products and services for the first time, he explained.

As applications of computers move away from standard record-keeping to on-line teleprocessing, people become much more important in achieving successful results with computers, he said.

The Caravane will allow users to exchange ideas and the latest techniques in such areas as systems organization, industrial applications of minicomputers and the effective use of service bureaus.

Octave Py, French marketing manager for the Caravane Informatique, expects to book all 70 booths before the end of the month. Companies such as Univac, Honeywell, Siemens and Data General have reserved space, he said.

The English Language Caravan and the West German Computer Caravan will be launched in the fall.



Photo by J. Mourreau

Officials of the Caravane Informatique and an interested visitor gather to discuss plans for the French Computer Users' Forum and Exposition. Assembled are Octave Py; Roland Medawar, vice-president; Patrick McGovern, president; Gilbert Christini; and Dave Sudkin, marketing manager of European Caravans.

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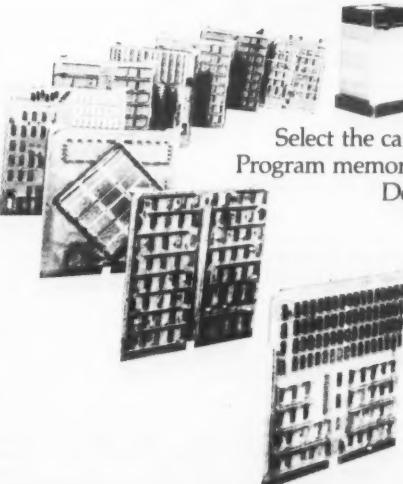
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## Adapso Sees Service Bureau Profits Rising as Part of '73 Growth Phase

NEW YORK — While the Control Data take-over of IBM's Service Bureau Corp. provided the biggest fireworks recently in the service bureau industry, signs show that the entire industry is in a growth phase.

Sales revenues for the computer services segment of the computer industry are expected to exceed \$3.5 billion in 1973 with a sharp increase in profitability for the firms in the industry, according to the Association of Data Processing Service Organizations (Adapso).

### Profit Rise

In its preliminary forecast for the year the group indicated that pre-tax profits for the firms in the business should average 7% of revenues during 1973, as opposed to the predicted 4.5% profits on revenues in 1972, according to J.L. Dreyer, executive vice-president for the organization.

"Batch processing will account for 44% of the volume; on-line processing 15%; software 16%; facilities management, keypunch, OCR and COM

15%" during 1973, he predicted.

### 200 New Firms Seen

Preliminary figures for 1972 indicate there were around 1,700 firms engaged in the services business in 1972 and that they generated revenues of approximately \$2.75 billion, Dreyer indicated.

In 1973, he forecast, 200 new firms will get into the business and will help boost the sales of services by 27% with profits being up 42% during the year just begun.

### Many Software Entrants

Of the increase, software houses will account for more than 50% of the new entrants; data centers 25%; on-line firms 10%; with the rest of the new companies in the facilities management or other specialized service areas, he said.

Present trends indicate a continued consolidation in the industry, but there will be fewer business failures in the field than in the past, Dreyer said.

## Early Relief Plan Submitted to Justice

(Continued from Page 25)

and magnetic disk packs) to any company willing to pay a reasonable price, and renting features of computers and devices to owners of IBM equipment.

In addition, priority for delivery should be determined strictly by receipt of order. Priority to order received on day of announcement will be given to manufacturers and service firms."

• "IBM is enjoined from blocking competition; manufacturing date must be reasonably certain before a new or modified product is announced either formally or informally. Results of performance tests, first delivery date, price, expected years in production — as well as the requirement of number two above — must be made public on any announcements of a new or modified product, whether officially announced or revealed to a single customer by an IBM employee.

"Search performance, price and delivery must be adhered to by IBM for the product; substitutions of alternate products must not be permitted."

### Matter of Survival

In releasing the details of the plan McGurk said: "The consensus of executives at our meetings was that early action must be taken. It was of the kind and in the priority we have initiated. There was agreement that without such relief the industry cannot survive as a competitive force during the lengthy course of the government suit."

Some of the items in the government's motion regarding the destruction of the index in the IBM/CDC case seem to indicate, legal sources said, that the Justice Department may be leaning toward some type of early relief while it tries its full case in court.

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## Swedish DP Market Awakening

STOCKHOLM, Sweden — Computer sales in Sweden, which have been sluggish during 1972, are expected to pick up during the coming year, the U.S. Department of Commerce reported.

The sluggishness in the computer market was blamed on "the general business recession of the past two years which has had a marked dampening effect on business investment," the department noted.

However, the department said, "late in 1972 indications were that recovery from the recession was under way, although slower than had been expected. Local trade sources anticipate that 1973 will be a better year in terms of sales volume."

Computer use in Sweden — 800 computer installations at the beginning of 1972, not counting minicomputers — "has grown by at least 20% annually in recent years, and this rate of increase may well continue through the seventies," the department said.

"However, since the replacement machines are so much more powerful than the equipment they replace, the rate of increase in the value of computers sold (as distinct from their capacity) is expected to slow down, possibly to half the former rate," the department added.

**Who Else?**

The Swedish computer market continues to be dominated by IBM, the department said, with approximately 57% of the business. ICL follows with 12%, then Honeywell-Bull with 9% and the domestic Dataaab with 8%.

The report noted, however, that the Swedish government is now placing greater emphasis on local industry.

"In October 1972 the Swedish govern-

### ICD Establishes Japanese Office Through Acquisition

NEWTONVILLE, Mass. — International Data Corp., a consulting company specializing in analyzing and forecasting the computer industry, has acquired a 50% interest in the Tokyo firm, International Consulting Co.

International Consulting Co., a market research and consulting firm, specializes in analyzing the computer and electronics industries. Its English-language publication *Japan Computer Report* will be retitled *EDP Japan Report*, and subscriptions in the U.S. and Europe will be available through IDC, publisher of *Computerworld*, *EDP Industry Report* and *EDP Europa Report*.

## Contracts

Computer Sciences Corp. has received a three-year, \$2.5 million contract to provide analysis and programming services to the U.S. Navy's Fleet Direction System Support Activity.

Hazeltine Corp. has been awarded a \$4.2-million contract for 90 AN/TPX-46 Identification Friend or Foe (IFF) Interrogator Systems from the U.S. Army Electronics Command.

Pitney Bowes has awarded a contract to Data Card Corp. for the development and manufacture of encoding equipment that will be used to print the Pitney Bowes machine-readable bar code (Codabar) on credit cards.

Interdata Inc. has signed a three-year OEM purchase agreement with Servo Corp. of America. Servo will purchase New Series minis for use in its system for control and scheduling of railroad freight cars.

Ampex Corp. has received a \$240,000 contract from Modular Computer Systems for core memory stacks to be used in Modular Computer's Modcomp II minicomputers.

ment, contrary to the recommendations of the Supreme Military Commander and the National Revenue Board who advocated the use of IBM equipment, announced its decision to award a defense contract to Swedish-owned Dataaab for two computer systems" worth \$3.7 million, the report said.

"The decision was explained in terms of the current high unemployment and the government's desire to support the domestic computer industry," Commerce added.

The best prospects for U.S. suppliers in the Swedish market during 1973, however, will continue to be for computer systems.

"A recent market study showed Swedish purchases of DP hardware in 1970 amounted to \$92 million. Of this about \$88 million was imported equipment, of which a third originated in the U.S. and a large proportion of the balance from European plants of American companies," the report said.

## Investors Skeptical of Antitrust Suits

LOS ANGELES — Security analysts "show extreme skepticism that the various suits against IBM will significantly change IBM's control over the industry during the next decade," according to the newsletter of the Computer Industry Association (CIA).

After a series of meetings with investors, the association concluded: "Almost any restraint imposed on IBM's unrestricted use of its market power during the course of the litigation would be considered indicative by Wall Street that a viable and ultimately competitive computer industry might someday become a reality."

"The power to unlock the money markets thus rests with the Department of Justice and Judge Edelstein of the U.S. District Court," the newsletter said.

The association urged the computer industry to start to consider how standards for product specifications will be determined, assuming the Justice Department wins its antitrust suit against

IBM.

It noted that a legal precedent applicable to the computer industry might evolve from the Bell & Howell suit against Eastman Kodak, which alleges that Kodak sets de facto standards to harm competitors.

On the recent settlement of the suit by Control Data Corp. against IBM, the newsletter said: "If we assume that CDC is depending upon the government's suit to make the necessary changes in the computer industry so that it will be a reasonably competitive marketplace, then this settlement must be reviewed as a fairly good return on the investment that CDC has made over the past four years in prosecuting the suit."

"Naturally, if we assume the government will be unsuccessful in constraining IBM in the future, it would not be as happy an outcome for CDC."

The newsletter can be obtained free from CIA headquarters, 16255 Ventura Blvd., Encino, Calif. 91316.

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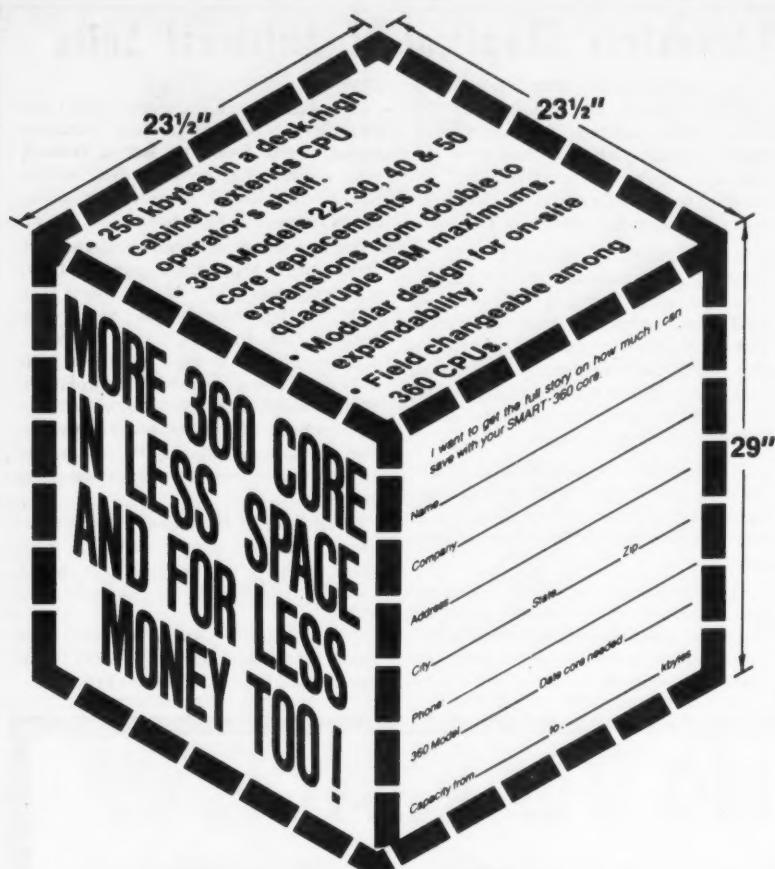
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## Potter Names George May Chief

MELVILLE, N.Y. — George W. May has been named president and chief operating officer of Potter Instrument Co. John T. Potter, who has held these posts since the company's founding in 1942, remains as chairman and chief executive.

May was previously president and chief operating officer of Victor Comptometer Corp. His election as president "substantially strengthens Potter's management in its expansion efforts in the data input field," Potter commented.

Future emphasis will be on stand-alone systems, such as off-line printers, magnetic disk data stations, interactive terminals and similar equipment, he said.

### Other Appointments

- Floyd H. Jean has been named vice-president, communications electronics center, for the Systems Division of Computer Sciences Corp.

- Philip S. Abrams, codeveloper of the APL time-sharing system, has joined Scientific Time Sharing Corp. as director of research.

- William J. Ballard, David J. Eskra and James M. Snodgrass have been named vice-presidents of Globe Decision Services, Inc.

- Stephen Schaub has been appointed senior vice-president, finance, of Boothe Computer Corp. He retains his position as president of Boothe Financial Services, Inc.

- Raymond F. Sebastian has been named executive vice-president and chief operating officer of Itel Corp.'s Leasing Division.

- Donald L. Eichler has been appointed vice-president of On-Line Business Systems, Inc.

- John W. Keogh has been named vice-president, marketing, and B.K. O'Brien vice-president, sales, at Basic Four Corp.

- Robert L. Hooper has been named vice-president, corporate marketing, at Compata, Inc.

- Robert J. Johnson has been named vice-president, advanced development,

### Executive Corner

and Alan J. Olkin vice-president, operations, for Datacraft Corp.

- Naomi J. Spinner is the new president and chairman of the board of SDA Information Sciences, Inc. She was previously treasurer of SDA as well as a member of the board.

- George H. Milne has been elected chairman of the board of Infonational, Inc., a San Diego-based computer services company. Infonational President Gary L. McMullen, who has been serving as chief operating officer, was elected chief executive officer.

- John B. Kelley has been named president of Technical Reproductions Corp., a wholly owned subsidiary of Burns and Roe, Inc. He will also continue to serve in his present positions as vice-president of Kamack Realty Corp. and assistant to the president (Burns and Roe, Inc.).

- James M. Hansell Jr., formerly general manager, has been elected president of Data Recognition Corp., manufacturer of OCR and data input systems.

- J. Thiel Sullivan has been named president of PRC Information Sciences Co. He was formerly vice-president of PRC and general manager of the firm's Information Systems Division.

- Richard D. Silverman has been named vice-president of operations for Data Products Corp.'s Telecommunications Division.

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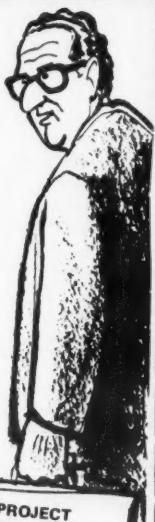
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<p><b>WORLDCOM</b> professionals in communications announcing <b>RED ALERT</b> service</p> <p><b>DATA SET REPAIR</b> Now...a complete new lab for even faster service. 24 hour in-shop turnaround on most couplers for 103 compatible models. Call Don Alford, engineering department, today.</p> <p>9982 Monroe Drive Dallas, Texas 75220 (214) 358-2561</p>				
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<p><b>FOR SALE</b> 360-40, 128K With features 3237, 4427, 6980, 6981, 7520, 7920 and a 1052-7. Available May 1973. Call: Mr. Murphy (415) 982-1405</p> <p><b>XDS SIGMA 7</b> Immediate Availability XDS maintained, excellent condition, wide range of peripherals and options. Priced for quick movement. Contact Harvey Mundee (213) 882-5540 Valley Computer Corp. 20923 Plummer Street Chatsworth, Calif. 91311</p>				
<p><b>BEFORE YOU BUY</b>  <b>BEFORE YOU SELL</b></p> <p><b>GO GREYHOUND</b> FOR SALE AVAILABLE FOR LEASE WANTED 360/30's 2401-2's 2365 Core 360/65 360/40's 2311's 360/50 2314's</p> <p>WRITE: Manager of Resale Equipment Greyhound Computer Corporation Greyhound Tower Phoenix, Arizona 85077</p> <p>PHONE: (602) 248-5972</p>				
<p><b>CORE MEMORY REPAIRS</b></p> <p>"FX SYSTEMS CORPORATION has acquired the Memory Division of Ferroxcube Corporation and now has the capability to repair/rework/rebuild Ferroxcube-produced core memory planes, stacks, and systems. In many cases, we can rebuild, replace or build new units for most of the popular Ferroxcube memory products and, in some cases, other memory manufacturers' products. "FX SYSTEMS, previously the Memory Division of Ferroxcube, has the most experienced and well-equipped independent core repair group. FXS also has available to OEM's and users a wide range of core memory planes, stacks, and systems.</p> <p>"For more information or to place your order... Call Bob Crane."</p> <p><b>F.X. Sys. Corp.</b> Mt. Marion Rd. Saugerties, N.Y. 12477 (914) 246-9571</p> <p><b>fx</b></p>				
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<p><b>THE CLC CORNER</b></p> <p><b>COMPUTER LEASING COMPANY OFFERS FOR SALE, RENTAL OR LEASE</b></p> <p><b>2401 Tape Drives</b> (MODELS 1, 2, 3, 4, 6)</p> <p>Low purchase prices—Buy now, or apply generous rental credits toward purchase. Economical rental/lease plans—Terms to fit your needs, from month-to-month to five years; unlimited usage; maintenance and insurance paid by CLC. Superior quality—Like-new condition; continued IBM maintenance guaranteed. Fast service—2-week delivery and installation.</p> <p><b>CALL (703) 521-2900</b></p> <p>Ask Hayden Williams for name of sales representative nearest you. The men who know their business get their computing equipment from... <b>CLC Computer Leasing COMPANY</b> 2001 Jefferson Davis Highway, Arlington, Va. 22202 • Offices Nationwide BROKERS cooperation invited.</p>				

February 7, 1973

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<b>SALE/LEASE</b> <b>OR LEASE PRCH.</b> <b>HONEYWELL 1200-32K</b> <b>TAPE-DISK SYSTEM</b> <b>AVAILABLE MAY 1973</b>  ACS Equipment Corporation 8928 Spring Branch Drive Houston, Tx 77055 (713) 461-1333	<b>370/155</b> 1.5 MEG, 8 3330's, 2 2314's, 12 3420 Tapes, RJE, BATCH, TSO CAN YOU BEAT \$7.2/sec for a 60K region?  <b>360/65</b> 1.5 MEG, 4 3330's, 2 2314's, 10 3420 Tapes 8am-8pm 8pm-8am Not Avail \$95/hr. \$60/hr. \$50/hr. \$50/hr. \$40/hr.  <b>370/135</b> 144K, 6 2314, 6 2401-6 Tapes 8am-8pm 8pm-8am \$85/hr. \$55/hr. \$40/hr. \$35/hr. \$35/hr. \$30/hr.  <b>360/30</b> 64K, 6 2401 Tapes, 5 2311's 8am-8pm 8pm-8am \$50/hr. \$40/hr. \$33/hr. \$27/hr.  FOR FURTHER INFORMATION CALL PAUL SARRIS or RON ELLIS (312) 346-1331  <b>Computer Research</b> 200 N. Michigan Ave. Chicago, Ill. 60601 Largest Computer Time Sales Company	  <b>COMPUTER TIME AVAILABLE</b> We are Brokers for IBM, RCA, etc. LOW RATES <b>COMPUTER RESERVES</b> 393 Seventh Ave., NYC (201) 594-7935	<b>\$/360/50/40/30</b> 1287 <b>2671 Paper Tape Reader</b> <b>ALL SHIFTS</b> Call: Roy Einreinhofer Popular Services, Inc. (201) 471-2577	  <b>Software for Sale</b> Payroll Tax Changes Got You Up a Wall? Try  <b>TAXBREAK</b> Payroll tax calculation module for all states, federal, FICA and cities.  <b>ARGONAUT INFORMATION SYSTEMS, INC.</b> POST OFFICE BOX 112 WALNUT CREEK, CA. 94596 (415) 937-4675  <b>Certified Software Products</b> 2419 Nicollet Avenue Minneapolis, Minn. 55404 Tel. 612/332-9043

## Nickels & Dimes

Computer Automation's backlog grew to over \$9 million with the receipt of orders from five manufacturers totaling more than \$3.3 million for its Naked Mini and Alpha minicomputers. Current production is around 200 unit/mo, the firm said.

three-year \$25-million revolving credit from banks, led by First National City Bank, N.Y.

\$\$\$

Princeton Time Sharing Services changed its name to Octo, Ltd., as it no longer offers T/S services.

\$\$\$

Sperry Rand plans to offer \$60 million of 15-year convertible debentures to foreign investors.

\$\$\$

Intertel started off its fiscal year with receipt of modem orders valued at \$1.4 million.

\$\$\$

Autex, operator of a trading information system for securities dealers, saw earnings soar in 1972 to \$317,565 compared with \$44,490 for the previous year ended Sept. 30.

\$\$\$

Compuscan has installed over 70 Model 170 OCR systems, compared with 14 as of last April.

\$\$\$

Sycor has obtained a \$3-million line of credit from the First National Bank of Boston to finance leased equipment. The company also has increased from \$1.5 million to \$3.5 million its credit line at the Central National Bank of Cleveland, which is used to support investment in receivables.

\$\$\$

Hewlett-Packard shareholders will receive a regular semiannual 10 cent dividend April 16 on each share of common held March 26.

\$\$\$

Techtran Industries' first-quarter sales were more than half of the total sales for all of the preceding year. Revenues for the quarter ended Nov. 30 totaled \$254,532 with earnings of \$40,501. Techtran makes cassette terminals.

\$\$\$

University Computing has replaced a \$20-million line of credit repayable 1973-74 with a

regular semiannual 10 cent dividend April 16 on each share of common held March 26.

\$\$\$

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## DEC Quarter, Half Nets Rise 26%, 21%

MAYNARD, Mass. — Sparked by demand for the Decsystem-10, Digital Equipment Corp.'s second period and half earnings were up 26% and 21%, respectively, on revenue rises of 34% for both periods.

"During the six-month period, our large computer system, the Decsystem-10, has grown more rapidly than our expected rate in both orders booked and revenues," acknowledged President Kenneth H. Olsen.

"The time-sharing market is particularly strong along with an increasing customer base in online commercial data processing applications," he noted.

In the second quarter, earnings reached \$4.6 million or 42 cents

a share compared with \$3.6 million or 35 cents in the year-ago period. Revenues rose to \$60 million from \$44.9 million.

In the half, earnings totaled \$8 million or 75 cents a share compared with \$6.6 million or 64 cents a share in the 1971 period.

Revenues climbed to \$111.8 million from \$83.3 million.

"We feel that based on the current high level of business, we will be able to report continued improvement in both sales and earnings for the balance of the year," Olsen added.

## Communications Makers Show Rise In Earnings, Revenues for Year

Communications equipment makers Milgo Electronic Corp. and Wiltek, Inc. reported improved earnings and sales in fiscal 1972. Milgo continued the trend, with record first-quarter sales and earnings.

Milgo's earnings jumped dramatically in the year ended Sept. 30 to \$2.1 million or \$1.32 a share from \$240,000 or 15 cents a share last year — all this on a revenue rise to \$13.8 million from \$9.1 million.

Modem lease revenues totaled \$4.3 million in 1972 compared with \$1.4 million in 1971.

For the quarter ended Dec. 31, Milgo's earnings almost doubled to \$704,000 or 44 cents a share from \$370,000 or 23 cents a share in the comparable year-ago period.

Revenues reached \$4.8 million from \$2.4 million a year ago.

At Wiltek, sales for the year more than doubled to \$6.4 million from \$2.7 million in the period ended Oct. 31, 1971.

Earnings climbed to \$331,600, including a special charge of \$21,000, from \$319,700 in the year-ago period. In 1971, there was a \$104,000 tax credit.

The rate of orders for terminals continued to increase during the fourth quarter, according to President Robert J. Amman. Orders during the year exceeded \$9 million, bringing the Oct. 31 backlog to over \$5 million, he said.

## Data Products Doubles 9-Month Net

WOODLAND HILLS, Calif. — Data Products Corp. doubled its earnings for the nine-month period ended Dec. 23, while revenues continued at a record pace.

Earnings rose to \$1.2 million or 18 cents a share compared to \$488,000 or 7 cents a share in the year-earlier period. Revenues climbed to a record high of \$41.8 million, up nearly 14% from the \$36.8 million in the same 1971 period.

Data Products is witnessing an expanded market for its current products, according to President

Graham Tyson. Two new families of line printers and several new core memory products introduced in late 1972 will provide substantial growth and an increased share of market in the future, he said.

TEWKSBURY, Mass. — Higher volume generated by an increased sales force was a large factor in boosting Wang Laboratories Inc.'s sales and earnings for the second quarter, according to President An Wang.

In the period ended Dec. 31 earnings reached \$835,381 or 21 cents a share on sales of \$12.1 million. In the comparable year-ago quarter, earnings totaled \$555,721 or 14 cents a share on sales of \$8.5 million.

For the six months, a first-quarter loss of \$116,626 dragged down earnings to \$18,755 or 18 cents a share compared with \$1.1 million or 28 cents a share in the year-ago period.

Sales in the half year reached \$20 million, up from \$16.4 million last year.

The firm's newest calculator line, the 2200 Series, is scheduled for initial delivery in the fourth quarter, and the firm will announce several peripheral devices for this line in the third quarter, Wang said.

The loss during the first quarter resulted from a delay in delivering peripheral devices for the 700 Series of calculators, increased marketing expenses related to cassette typewriters and lower sales, Wang said.

## MDS Expands Credit Limit to \$112 Million

HERKIMER, N.Y. — Mohawk Data Sciences has boosted its borrowing capacity to \$112 million from a previous \$65 million.

"The new credit arrangements assure the continued financing of the rental program for our successful System 2400, as well as other rental equipment," President R.P. Rifenburgh said.

A credit line up to \$65 million from banks led by First National of Boston at .75% above the prime rate is complemented by a multicurrency agreement of \$35 million in Europe from banks led by the First National Bank of Chicago. In addition, Mohawk can borrow up to \$12 million outside the two agreements.

## BUY IT OR LEASE IT

### IBM 360/30

NVC Purchase: \$64,000.00  
NVC 36 mo. Lease: \$1,750.00/mo. (IBM MAC: \$3,685.00/mo.)

QUANTITY	MODEL/FEATURE	SERIAL NO.
1	360/30E (32K-1.5 mic) 3237, 4427, 4456, 4463 4468, 4760, 6960, 7915	15621
1	1051 3130, 4409, 4410, 4411	51410
1	1052 8	62543

If desired NVC will provide a 36 mo. Lease/Purchase Plan. 36 Mo. Rate: \$1,980.00/mo. Purchase Option: \$6,200.00

- Equipment acceptable for IBM Maintenance Agreement.
- Available for installation April 15, 1973.
- Lease rates are exclusive of maintenance and taxes but do include transportation to the installation site and installation.

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CONVERSION



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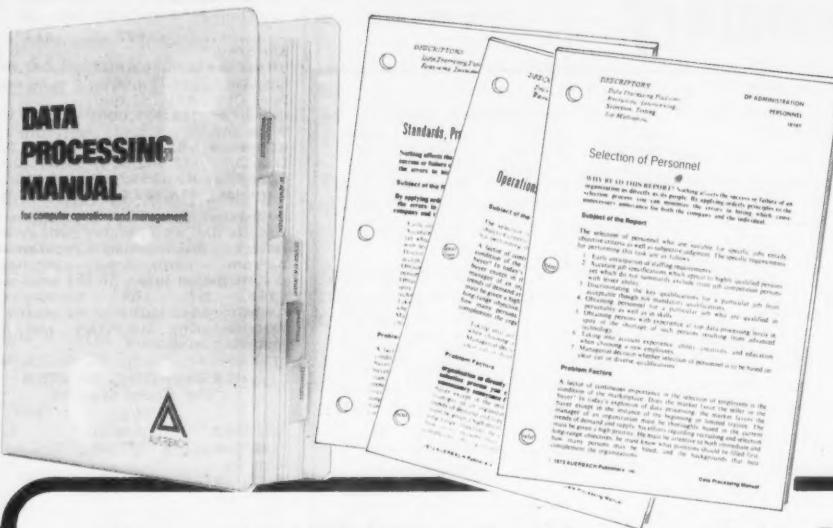
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Cambridge, Mass. 02139

CLOSING PRICES THURSDAY, FEBRUARY 1, 1973

		PRICE						PRICE							
		RANGE	CLOSE	WEEK	WEEK	(1)	FEB 01	NET	PCT	C	RANGE	CLOSE	WEEK	WEEK	
		(1)	1973	CHNGE	CHNGE		1973	CHNGE	CHNGE	H	(1)	1973	CHNGE	CHNGE	
SOFTWARE & EDP SERVICES															
O ADVANCED COMP TECH	1- 3	2	0	0.0			O TAB PRODUCTS CO	14- 23	19 1/4	-1 3/4	-8.3				
A APPLIED DATA RES.	3- 7	3 1/4	0	0.0			N UARCO	20- 28	21 5/8	+1 1/8	+5.4				
O APPLIED LOGIC	1- 4	2 3/4	0	0.0			N WALLACE BUS FORMS	21- 26	25	0	0.0				
N AUTOMATIC DATA PROC	70- 99	72 7/8	-14	-16.1			COMPUTER SYSTEMS								
O BRANDON APPLIED SYST	1- 2	3/4	0	0.0			N BURROUGHS CORP	147-230	219 3/4	-7/8	-0.3				
O COMPUTER DIMENSIONS	4- 14	3 1/2	0	0.0			N COLLINS RADIO	14- 27	23	+1 1/4	+5.7				
O COMPUTER DYNAMICS	1- 4	1	0	0.0			N CONTROL DATA CORP	43- 78	55 1/8	-1/8	-0.2				
O COMPUTER NETWORK	3- 7	3 1/4	0	0.0			O DATA GENERAL CORP	56-130	120	-1	-0.8				
N COMPUTER SCIENCES	4- 10	4 3/8	-1/4	-5.4			N DIGITAL EQUIPMENT	72-101	96 1/4	-1/4	-0.2				
O COMPUTER TASK GROUP	1- 2	1 1/2	+1/8	+9.0			N ELECTRONIC ASSOC.	6- 13	8 1/4	+1 1/8	+1.5				
O COMPUTER TECHNOLOGY	2- 8	2 3/8	-3/8	-13.6			A ELECTRONIC ENGINEER.	6- 14	8	-1/2	-5.8				
O COMPUTER USAGE	7- 14	7 3/4	-3/8	-4.6			N FOXBORO	23- 41	29 1/2	-5/8	-2.0				
N COMPUTING & SOFTWARE	11- 28	11	+1/4	+2.3			O GENERAL AUTOMATION	13- 54	52 1/4	+5 1/2	+11.7				
O COMRESS	1- 3	1	0	0.0			N HEWLETT-PACKARD CO	2- 5	2 1/2	0	0.0				
O COMSHARE	5- 10	8 1/8	-7/8	-9.7			N HONEYWELL INC	118-170	119 3/4	-9	-6.9				
O DATATAB	4- 9	3 3/4	-1/4	-6.2			N IBM	333-444	429	-7	-1.6				
O EDP RESOURCES	2- 8	1 3/4	-1	-36.3			LEASING COMPANIES								
A ELECT COMP PROG	1- 5	1 5/8	0	0.0			O INTERDATA INC	8- 16	10 5/8	-1	-8.6				
O INFORMATICS	43- 65	51 1/2	-1 1/4	-2.3			N MEMOREX	14- 38	13 5/8	-3 1/8	-18.6				
O I.O.A. DATA CORP	1- 3	5/8	-1/8	-16.6			O MICRODATA CORP	5- 10	8 1/2	-7/8	-9.3				
O KEANE ASSOCIATES	4- 7	3 3/4	0	0.0			N NCR	28- 38	28 1/4	-1 1/4	-4.2				
O KEYDATA CORP	7- 13	9 3/4	-1	-9.3			N RAYTHEON CO	27- 47	30 7/8	+5 1/8	+2.0				
O LOGICON	4- 9	3 1/2	-1/4	-6.6			A SYSTEMS ENG. LABS	30- 50	43 1/8	-4 5/8	-9.6				
A MANAGEMENT DATA	4- 10	3 3/4	-1/8	-3.2			N VARIAN ASSOCIATES	14- 22	17	-3/8	-2.1				
O NATIONAL CSS INC	8- 36	32 1/4	-1 3/8	-4.0			N WANG LABS.	23- 61	29	-1/2	-1.6				
O NATIONAL INFO SRVCS	1- 5	2	-1/4	-11.1			N XEROX CORP	121-172	151	-1 1/2	-0.9				
P ON LINE SYSTEMS INC	8- 28	24 1/4	-1/4	-1.0			LEASING COMPANIES								
N PLANNING RESEARCH	5- 17	4 7/8	0	0.0			A BOOTHE COMPUTER	3- 18	2 5/8	-3/8	-12.5				
O PROGRAMMING METHODS	20- 25	22 1/2	-1 1/4	-5.2			O BRESNAHAN COMP.	1- 3	1 3/8	0	0.0				
O PROGRAMMING & SYS	1- 2	1	+1/4	+33.3			O COMDISCO INC	3- 18	13 5/8	-2	-12.7				
O RAPIDATA INC	5- 27	22 1/2	-3/4	-3.2			O COMMERCE GROUP CORP	5- 11	4 7/8	-1/2	-9.3				
O SCIENTIFIC COMPUTERS	2- 4	1 5/8	+1/8	+8.3			A COMPUTER EXCHANGE	1- 3	5/8	0	0.0				
O SIMPLICITY COMPUTER	1- 5	3 3/8	-1/8	-3.5			O COMPUTER INVSTRS GRP	6- 14	6 1/8	-1/4	-3.9				
O TBS COMPUTER CENTERS	3- 6	3 1/2	-1/4	-6.6			O COMP. INSTALLATIONS	2- 5	2	0	0.0				
O TCC INC	1- 3	3/4	+1/4	+50.0			N DPF INC	5- 13	7 1/2	0	0.0				
O TYMSHARE INC	7- 12	9 3/4	-1 1/8	-10.3			N DATRONIC RENTAL	2- 4	2 1/8	-1/8	-5.5				
O UNITED DATA CENTER	5- 8	6	0	0.0			A DCL INC	2- 10	2 3/8	-1/4	-9.5				
N UNIVERSITY COMPUTING	8- 26	7 3/4	-3/4	-8.8			A DEARBORN-STORM	16- 26	21 3/4	-3/4	-3.3				
A URS SYSTEMS	6- 10	6 1/4	+1/2	+8.6			A GRANITE MGT	5- 11	5 3/8	-1/4	-4.4				
PERIPHERALS & SUBSYSTEMS															
N ADDRESSOGRAPH-MULT	27- 49	26 5/8	-3/8	-1.3			A GREYHOUND COMPUTER	5- 11	5	-5/8	-11.1				
O ADVANCED MEMORY SYS	12- 23	19 5/8	-1 5/8	-7.6			N ITEL	7- 12	10	-1 1/8	-10.1				
N AMPLEX CORP	5- 15	6 1/8	+3/8	+6.5			N LEASCO CORP	13- 24	13	-1 3/4	-11.8				
O ANDERSON JACOBSON	4- 8	4 3/4	0	0.0			N LEASPACE CORP	6- 15	6 1/4	-1/2	-7.4				
O BEEHIVE MEDICAL ELEC	1- 8	6 1/4	-5/8	-9.0			O LECTRO MGT INC	1- 4	1 3/4	-1/8	-6.6				
A BOLT, BERANEK & NEW	5- 21	10	-5/8	-5.8			A ROCKWOOD COMPUTER	2- 7	2 3/8	0	0.0				
N BUNKER-RAMO	9- 14	8 1/2	-5/8	-6.8			O SYSTEMS CAPITAL	3- 20	10 3/8	-3/4	-6.7				
A CALCOMP	9- 25	10 3/4	0	0.0			N U.S. LEASING	19- 35	32	-1/2	-1.5				
O CAMBRIDGE MEMORIES	9- 15	11 1/4	-1 1/2	-11.7			EXCH: N=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE L=NATIONAL EXCHANGE; O=OVER-THE-COUNTER P=PHIL-BALT-WASH O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID (1) TO NEAREST DOLLAR								
O CENTRONICS DATA COMP	6- 28	23 3/4	+1/2	+2.1											
O CODEX CORP	6- 25	17	-1/4	-1.4											
O COGNITRONICS	2- 5	2 1/8	-1/8	-5.5											
O COMPUTER COMMUN.	1- 7	3 1/8	-1/4	-7.4											
A COMPUTER EQUIPMENT	2- 4	2 5/8	+1/8	+5.0											
O COMPUTER MACHINERY	7- 13	10 1/2	-1/8	-1.1											
O COMPUTER TRANSCEIVER	2- 9	3 3/4	-3/4	-16.6											
A COMPUTEST	3- 9	3 3/4	0	0.0											
N CONRAC CORP	24- 39	26	-1 1/2	-5.4											
A DATA PRODUCTS CORP	3- 7	3 7/8	-1/8	-3.1											
O DATA RECOGNITION	1- 5	2 1/2	0	0.0											
O DATA TECHNOLOGY	2- 5	3 3/4	-1/8	-3.2											
O DIAN CONTROLS	0- 8	3 7/8	0	0.0											
N ELECTRONIC H & M	3- 8	4 1/2	-1/8	-2.7											
O FABRI-TEK	2- 5	4 1/4	0	0.0											
O GENERAL COMPUTER SYS	6- 16	7 1/2	-1/4	-3.2											
N GENERAL ELECTRIC	59- 74	68 1/2	0	0.0											
N HAZELTINE CORP	7- 13	8 1/2	+3/8	+4.6											
O INFOREX INC	17- 36	17 3/8	-3/8	-2.6											
O INFORMATION DISPLAYS	1- 5	7/8	-1/8	-12.5											
O INFORMATION INTL INC	8- 25	11 1/2	-1	-8.0											
A LUNDY ELECTRONICS	8- 14	8 1/8	-5/8	-7.1											

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